The Value Relevance of Annual Reports

- An Empirical Study of the Earnings Response Coefficient and Cumulative Abnormal Returns of Finnish Firms

Baltzar Lindroos
Master's thesis in accounting
Supervisor: Prof. Ralf Östermark
Faculty of Social Sciences,
Business and Economics
Åbo Akademi University
Turku 2020

ÅBO AKADEMI UNIVERSITY – Faculty of Social Sciences, Business and Economics
Abstract for Master's thesis

Subject: Accounting	**Writer:** Baltzar Lindroos
Title: The Value Relevance of Annual Reports – An Empirical Study of the Earnings Response Coefficient and Cumulative Abnormal Returns of Finnish Firms	
Supervisor: Prof. Ralf Östermark	

Abstract:

The value relevance of accounting information is explored in this thesis by describing the relationship between the announcement of a firm's annual report and the response of the capital market using the earnings response coefficient (ERC). Further, the study discovers the factors affecting the cumulative abnormal returns (CARs) of firms to improve the understanding of the value relevance of annual reports. Accounting information is outdated and depicts a firm's past performance. The information is costly to produce, and concern has arisen whether a firm's stakeholders find the announced information value relevant, or if the information is the result of laws and regulations.

Cumulative abnormal returns were regressed on unexpected earnings to estimate the ERC using OLS regression. CARs were then predicted using the ERC regression, and the estimates were regressed using a pooled OLS regression on variables from the income statement, balance sheet and cash flow statement to shed light on which factors affect CARs. The sample consisted of 221 firm observations of 45 Finnish firms listed on the Helsinki Stock Exchange (HSE) during 2014-2018.

Results revealed a statistically significant positive relationship between unexpected earnings and cumulative abnormal returns, but a causal inference was not possible due to the sample size. The ERC estimate was small compared to previous research, although the annual report is value relevant. Furthermore, results revealed that a firm's income statement and balance sheet are value relevant, but the cash flow information is not. The findings provided a new insight that accounting reports are value relevant when viewed together since the reports' line items partially explain the variation in CARs. However, although the findings indicate low value relevance to investors, other stakeholder groups may find the annual report more (or less) value relevant.

Keywords: Value relevance, annual reports, earnings response coefficient, cumulative abnormal returns, Helsinki Stock Exchange

Date: 18.05.2020	**Number of pages:** 92

CONTENTS

1 INTRODUCTION

This dissertation is a report of an empirical study of the value relevance of Finnish publicly-listed firms' annual reports from 2014 to 2018. The first chapter of the dissertation presents the background of the study, describes the problem statement, the study's significance, purpose, and delimitations and concludes by presenting the outline of the study.

The earnings response coefficient (ERC) is a frequently used measurement of the value relevance of accounting information (Scott, 2015, 153), and describes the relationship between financial statements and the capital market (Kothari, 2001). The ERC is defined as a measure of how earnings surprises and stock returns are related during the time of the announcement of a firm's earnings (Campbell, 2018). The coefficient measures the value relevance of announced earnings as a "marginal change in share returns for one unit of unexpected earnings announced as measured over a short or long window" (Al-Baidhani, Abdullah, Ariff, Cheng, & Karbhari, 2017b, 299). Consequently, the earnings response coefficient is a straightforward measurement of the value relevance of accounting information.

Abnormal returns and unexpected earnings must be calculated to measure the ERC. Abnormal returns (AR) are calculated according to the market-adjusted return model, as suggested by Al-Baidhani et al. (2017a; 2017b). The model calculates AR as the difference between the return of the security and the return of the market index (see Equation 6 in section 2.2.1 for its application). The abnormal return is summarised during an eleven-day event window CAR [-5, 5] (see Equation 9). In addition, the advantages and disadvantages of different AR calculation methods are discussed in section 2.2.1. The naïve expectation model is used to calculate unexpected earnings (UE) since it is the best unbiased approximation of UE (Ball & Brown, 1968). Unexpected earnings are calculated by subtracting the previous year's earnings per share from the current year's earnings per share (see Equation 10) (Ariff, Fah, & Ni, 2013). The difference is the unexpected share of earnings. An example of the AR and UE application is given for illustration purposes in Chapter 4.2.

Moreover, Gjerde, Knivsflå and Sættem (2011) argue that cumulative abnormal returns (CARs) can be used as another measurement of value relevance. CAR is the difference between the cumulative return of a security and the market (see Equation 9).

However, value relevance is a multifaceted aspect of accounting and, hence, is affected by multiple factors, including regulatory and legal characteristics and market forces (Sahut, Boulerne, & Teulon, 2011). For instance, the value relevance of financial statements of Finnish firms can be affected by the choice of using Finnish Accounting Standards (FAS) or International Financial Reporting Standards (IFRS). Furthermore, value relevance is generally substituted by reliability, which creates a trade-off between information that is value relevant to stakeholders and information that is reliable to stakeholders (Erb & Pelger, 2015). Due to the multifaceted nature of value relevance, several measurement options arise depending on which stakeholder's value relevance is being measured.

1.1 Background of the Study

> *The real source of our present maladies is that bookkeeping has become unhinged from value. Accounting is no longer counting what counts. … As accounting has lost its anchor to value, it has forfeited its stature. … It has degenerated into a game whose main aim is prettifying earnings reports. (Stewart, 2002, 1)*

The empirical research of the relation between capital markets and financial statements originated from the study of Ball and Brown in 1968, who revealed that accounting numbers are, in fact, useful to the firm's stakeholders and affect capital markets (Kothari, 2001). The most widely used tool to measure value relevance is by analysing the capital market's response to the announcement of a firm's financial statements, for instance, annual reports (Al-Baidhani et al., 2017b). However, it is not the only tool to measure the relationship as Badu and Appiah (2018) argue that different stakeholders measure value relevance differently due to their individual needs. For instance, a creditor may measure value relevance using cash flows or the capital structure of the firm, while an equity investor may measure value relevance using capital markets.

The Finnish accounting system is characterised by its strong link to corporate taxation and conservativeness (Niskanen, Kinnunen, & Kasanen, 2000). The close connection prompts Finnish firms to conform their accounting to their taxation. A firm can only deduct a cost in taxation if it is expensed in the income statement during the same fiscal year. Conservatism is described by Balachandran and Mohanram (2011, 275) as the choice "to understate net assets and cumulative income". Amir and Lev (1996) argue that conservative accounting laws lead to conservative financial statements resulting in less value relevance of accounting information. Therefore, contemporary financial reporting does not serve the need of today's firms, but rather, the need of firms of the bygone industrial era (Francis & Schipper, 1999). Niskanen et al. (2000) add that the strong link between Finnish accounting standards and corporate taxation in Finland results in less conformance between Finnish and international accounting standards (IAS).

In addition, accounting activities are expensive. Finnish firms are annually spending vast amounts of capital on accounting activities, preparation, and auditing of their financial statements. According to Huhn (2019), Finnish firms spent more than EUR 1.7 billion in 2017 on accounting, bookkeeping, and auditing activities. Consequently, the question of whether these expenses are beneficial for the firm or if they are the result of laws and regulations arises.

Furthermore, financial statements are published throughout the year, and interim reports enable firms to report their research and development (R&D), prospects, development strategy, and other *immaterial information* (Schadewitz & Kanto, 2002). In addition, Kanto and Schadewitz (2000) add that Finnish firms typically announce preliminary annual reports and, therefore, plenty of information is already anticipated in the annual report. Consequently, an opportunity to explore the value relevance of the annual report, which is assumed low by Kanto and Schadewitz (2000), arises.

1.2 Problem Discussion

Accounting information is seldom timely information. Once an accounting transaction is recorded, it is already in the past. According to Schadewitz and Kanto (2002), earnings figures and annual reports are historical information. Nevertheless, Ball and Shivakumar

(2008) contend that the earnings announcement can contain new and unexpected information. However, earnings announcements occur infrequently and often only quarterly.

In comparison, stakeholders, such as investors, analyse firms daily and will change their beliefs accordingly. Therefore, there exists a mismatch between when a firm releases financial reports and when a stakeholder evaluates a firm. Furthermore, the possibility of information asymmetry arises, since managers have more timely information than stakeholders do.

Further, the choice of Finnish firms to use Finnish or international accounting standards influences the information published in the firm's financial statements. There are substantial discrepancies between the two standards, which may significantly alter the firm's financial statements (Niskanen et al., 2000). Therefore, when measuring the value relevance of accounting information using the earnings response coefficient, it is imperative to acknowledge this distinguishing feature.

Similarly, globalisation, the conglomerate nature of business, and the technology revolution create financial reporting complications (Junttila, Kallunki, Kärja, & Martikainen, 2005). Increasing investments in intangible assets and research and development can create potential problems when exploring the value relevance of financial statements since high-technology firms often have transitory earnings (Francis & Schipper, 1999). Therefore, the fact that a specific earnings response coefficient has been found in a particular sample at a distinct occasion does not mean that the same ERC will be found in another sample or, even, in the same sample in a different period. Consequently, there is a constant need to explore the earnings response coefficient and the value relevance of accounting information continuously.

Deegan and Unerman (2011, 459) explain that increased awareness and understanding of value relevance enable firms to enhance their financial accounting, thus facilitating practising accountants. Furthermore, it helps firms make better financial reporting decisions by increasing the value relevance of the reports. Similarly, increased awareness helps finance professionals, such as security analysts, better form an opinion about and analyse a firm. Furthermore, Kothari (2001) adds that research on earnings response coefficients improves the understanding of voluntary disclosures in accounting and has

potential use in fundamental analysis and firm valuation. However, Deegan and Unerman (2011, 461) underline that accounting is not the sole source of information affecting the capital market, although it is an important one.

A returns and earnings regression can be performed with explanatory variables from the firm's income statement, balance sheet, and cash flow statement to analyse the factors that affect the value relevance of annual reports (Liu & Thomas, 2000). Aboody, Hughes and Liu (2002) add that researchers frequently analyse value relevance by regressing stock returns on accounting variables. Nichols and Wahlen (2004) clarify that the earnings response coefficient can be estimated to assess the size of the ERC of an individual firm or a portfolio of firms. However, the ERC measurement is affected by its static nature; that is, cumulative abnormal returns are regressed on unexpected earnings that omit future earnings. Therefore, the authors argue that the cumulative abnormal return (CAR) should be analysed surrounding the announcement of the annual report. Consequently, by regressing CAR on variables from the annual report, it is possible to asses whether the information in the annual report provides value relevant information to the firm's stakeholders.

Previous research has studied the value relevance of different financial statements such as the income statement (see, e.g. Collins, Maydew, & Weiss, 1997; Francis & Schipper, 1999), the balance sheet (see, e.g. Huang & Zhang, 2012) and the cash flow statement (see, e.g. Mostafa & Dixon, 2013). However, there is an apparent gap in previous research to be filled, as requested by Al-Baidhani et al. (2017b), concerning the aggregate effect of financial statements on the value relevance of annual reports. By incorporating more aspects that complement each other from a firm's annual report, it is possible to provide new empirical evidence of which factors explain the return and earnings relation surrounding the announcement of the annual report. That is, what factors, other than the current earnings level, can explain the abnormal return. The relationship between earnings and the capital market has been studied in Finland. However, it has not been subjected to research in recent years.

The following hypothesis is developed to analyse the relationship between the release of the annual report and the reaction of the capital market:

H1. Abnormal stock returns are positively correlated to unexpected changes in earnings of firms listed on the Helsinki Stock Exchange during 2014-2018.

By continuing the analysis, the value relevance of different components of a firm's financial reports is explored. Therefore, the second through fourth hypotheses are:

H2. The cumulative abnormal return of HSE firms is significantly affected by components from the income statement.

H3. The cumulative abnormal return of HSE firms is significantly affected by components from the balance sheet.

H4. The cumulative abnormal return of HSE firms is significantly affected by cash flow components.

For a detailed development of hypotheses, see Chapter 3.4.

1.3 Purpose of the Study

The primary purpose of the study is to explore the value relevance of accounting information by describing the relationship between the announcement of a firm's annual report and the response of the capital market using the earnings response coefficient. Further, the study's secondary purpose is to discover which are the factors explaining the cumulative abnormal returns of Finnish publicly-listed firms during 2014-2018 to improve the understanding of the value relevance of annual reports.

By utilising a theoretical framework, reviewing previous studies and performing a quantitative study using pooled Ordinary Least Squares (OLS) regressions, the hypotheses of the study will be tested.

1.4 Delimitations of the Study

The study is limited by its geographical scope, as only publicly-listed firms on the Helsinki Stock Exchange are included in the study. Moreover, a limit of the study is the period analysed, which includes firm observations from 2014 to 2018. Further, the study is limited by excluding financial and insurance firms due to the firms' different legislation. In addition, so-called penny stocks, that is, firms traded below four euros per share in this case, are removed from the sample.

Similar to Beaver (1968), the study is not concerned whether a firm's stakeholders should react to earnings announcements but, instead, if they de facto do react to earnings announcements. Thus, the positivist approach of the study is emphasised.

1.5 Outline of the Study

The study is organised as follows. Chapter 2 begins with a theoretical framework introducing the research area. Chapter 3 discusses previous research and develops the hypotheses of the study. Chapter 4 presents the research method and the sample used in the study. Empirical results are presented and interpreted in Chapter 5, followed by a conclusion in Chapter 6. Lastly, a Swedish summary is provided in Chapter 7.

2 THEORETICAL FRAMEWORK

This chapter introduces the research area. The chapter begins by explaining the value relevance of accounting information and the relevance-reliability dilemma, followed by how value relevance is measured. Later, the earnings response coefficient is derived, and the relationship between earnings and capital markets is discussed. The chapter ends with an overview of efficient market theory in contrast to behavioural finance and prospect theory.

2.1 The Value Relevance of Accounting Information

In this section, the value relevance of accounting information is explained, and the reasons why accounting information is of importance are discussed. Further, the trade-off between relevance and reliability is explored, and the notion of accounting information is discussed. Next, measurements of the value relevance of accounting information are considered and, finally, the value relevance of different financial statements is reviewed.

Scott (2015, 154) argues that one must consider what usefulness and relevance genuinely mean in the context of accounting information. The term usefulness has a different meaning to accountants and investors than for, for instance, society at large. It is important to note that society is not necessarily better off from increasing the value relevance of accounting information, since there is a distinct disparity between private and social values. Scott (2015, 154) states that "information is a very complex commodity" indicating the importance of understanding why certain stakeholder groups are prepared to pay for accounting information while others are discouraged. Accounting information is often free of charge to its users, but the firm may have to finance the cost of preparing the information by increasing its products' prices. An investor in the firm may accept the increased prices, if it means that the firm can increase resources to its accounting department; meanwhile, the firm's customers may reject price increases.

Furthermore, value relevance can help standard-setters by providing insights into key questions of accounting. Standard-setters such as the Financial Accounting Standards Board (FASB) use relevance, but also reliability, as measurements, when assessing new

accounting practises (Barth, Beaver, & Landsman, 2001). However, the authors argue that value relevance signifies both relevant and reliable information. If value relevance exists, the assumption that reliability exists simultaneously can be made. Thus, relevance and reliability are not dichotomous characteristics.

Contrary to Barth et al. (2001), Holthausen and Watts (2001) emphasise that the focus of the value relevance of accounting information cannot be to, exclusively, influence standard-setters since increased value relevance does not, necessarily, equal increased information quality. Investors often search for the *true value* of a security and therefore expect firms to report accounting numbers using fair values (Holthausen & Watts, 2001). It is important to note, nevertheless, that this information can be useful and accurate for investors but misleading to other stakeholder groups. The meaning of value relevance can, therefore, change depending on the user of the information.

Capital providers, for instance, have different objectives and, thus, use a variety of accounting information for different purposes. However, capital providers do not use accounting information exclusively. Consequently, the objective of financial accounting may not be to provide a true and fair view of a firm. Instead, the information should enable standardisation, regularity, objectivity and verifiability (Cascino et al., 2014).

A frequently applied value relevance measurement is to analyse how a security's market price responds to the release of new accounting information (Al-Baidhani et al., 2017b). Hence, if the capital market reacts to new accounting information, the information is considered value relevant. Scott (2015, 154) states that value relevant accounting information aids investors in better decision-making and evaluating the risks associated with the firm. Furthermore, value relevance helps investors estimating the expected return of the security. Low value relevance or the lack of it would signify that investors hold their beliefs of the security upon the release of new accounting information. Thus, no price correction of the security would be visible, and decisions to buy or sell the security are not initiated. However, value relevance can be measured in multiple ways depending on the stakeholder. Therefore, accounting information that has value relevance to an investor could be of less relevance to a customer. Consequently, to measure value relevance, careful consideration must be made regarding which stakeholder is in focus.

2.1.1 Accounting Relevance in Decision-making

Relevance is an ambiguous concept with complex meaning and favours myopic behaviour that prefers immediate consequences (Augier & March, 2007). Graaf (2016) puts relevance into action and states that accounting information has relevance if the information is used in decision-making or aids the decision-making process. The author stresses that it is essential to remember the relativity of relevance, since one can claim that something is relevant in itself and that something is relevant concerning something else. Lukka and Suomala (2014, 205) clarify by defining relevance as "something that is of significance for something else", underlining that relevance concerns another object. Rautiainen, Sippola and Mättö (2017) continue that relevance in accounting usually refers to a material impact on firm value, which can be measured with, for instance, profitability measurements. Therefore, value relevance from a practical point of view regards profit maximisation. Socea (2012) adds that for financial accounting information to be considered as relevant when making a decision, the information has to be comparable, reliable, and intangible. The different qualities of relevance illustrate the ambiguity of the word, since the meaning of it is wholly circumstantial.

However, Holthausen and Watts (2001) proclaim that accounting serves multiple purposes and, thus, fulfils various functions. To study the relevance of financial statements is hence multi-dimensional. Accounting information can be relevant regarding one purpose while simultaneously being less relevant regarding other purposes. Rautiainen et al. (2017) continue that relevance can have multiple meanings depending on which stakeholder is in mind, which in turn can create power games and conflicts in organisations. Therefore, when assessing value relevance, stakeholders' interest must be in focus, and it must be clear whose relevance is being explored. Consequently, the authors argue that although researchers find instances where the value relevance of accounting information is low, it does not imply that accounting information overall is value irrelevant.

Accounting relevance is widely discussed in the accounting literature, and problems such as relevance gaps and paradoxes are put forward. However, an important observation is de facto that someone seldom requests less relevance (Graaf, 2016). High relevance is commonly considered preferential, and there is a constant pressure to increase relevance with the assumption that the current state of information is value irrelevant.

Further, accounting relevance is seen as essential by standard-setters such as the IASB, and Graaf (2016) states that relevance is easy to explain in theory but rather difficult to measure in practice. Relevance should be defined and measured relative to something else. However, accounting relevance research often excludes this part in favour of finding relevance in the accounting numbers themselves. Thus, the author argues that a circular reasoning problem occurs because traditionally, value relevance exists if accounting information is used in decision-making. However, by using accounting information, it becomes relevant. Therefore, all accounting information is relevant if it is used in decision-making. Problems arise when using irrelevant information in decision-making since the use of it makes the information seem relevant. Such information is de facto not relevant and is instead described by Graaf (2016) as *extrinsic relevance*. External factors could, therefore, demand the use of information which would create a fabricated relevance.

A different take on the relevance dilemma is put forward by Vollmer (2007), who explains relevance based on *hyperreal circulation* and *systems trust*. Information is interpreted collectively by stakeholder groups although individual interpretation is possible. Information from financial reports circulates and creates trust by institutionalisation resulting in stakeholders interpreting information as relevant, although the perceived relevance stems from the expectation that other stakeholders will do the same.

The opposite of relevance is irrelevance, and accounting information must fit either. According to Graaf (2016), accounting information used in decision-making will afterwards become irrelevant again. This process means that decision-making marks the end of the relevance of information. In other words, decision-making consumes the value relevance of accounting information.

However, Graaf (2016) accentuates another perspective of value relevance and decision-making, namely that every decision is a promise. Once a decision has been made, the decision-maker must negotiate the promise and the decision that was made continually. According to this view, Mouritsen and Kreiner (2016) argue that the decision-making process marks new beginnings rather than ends because a decision can be thought of as a promise to achieve something else. The decision-maker is, therefore, not only concerned with the activities leading up to the decision but also the future. This perspective means that irrelevant information that becomes relevant through the decision-making process

can stay relevant after the process has ended. Thus, accounting information can stay value relevant after its intended use as well.

In this thesis, relevance, and more specifically, value relevance, is defined in line with the opinion of Graaf (2016) that relevance must be measured in relation to something else, and in the view of Rautiainen et al. (2017) that value relevance in accounting is measured as an impact on firm value.

2.1.2 Reliability as a Contrast to Relevance

To fully grasp the notion of accounting relevance, another characteristic of accounting information which affects the usefulness of information must be addressed, namely *reliability*.

Accounting information must be relevant and reliable simultaneously; however, the degree of each can fluctuate depending on the type of information (Johnson, L. T., 2005). According to Kadous, Koonce and Thayer (2012), reliability is today referred to as *representational faithfulness* by the FASB and IASB. The term was re-framed in 2010 due to misunderstanding of the correct meaning of reliability (Erb & Pelger, 2015).

L. T. Johnson (2005) claims that reliability can be viewed as verifiability or precision. Verifiability means that one can verify the information presented in the financial report, and precision implies that the information is precise and accurate. Ultimately, the author argues that reliable information is information that is reasonably free from error and presents what it ought to present. Erb and Pelger (2015) add that the FASB re-framed the concept as a response to fair value accounting and misunderstanding of the word *reliability*. Therefore, the re-framing is merely a change of name and not a change of substance, although, the concept became increasingly abstract in the process.

Similarly, Power (2010) argues that the change merged reliability into relevance and, thus, relevance and representational faithfulness fundamentally have the same meaning. Accounting information can be precise, but it does not mean that it is a faithful representation of what it aims to represent.

Due to firms having many stakeholders with diverse needs, various trade-offs between relevance and reliability are made. On the one hand, a firm might prefer a financial statement with high reliability, since it increases the chance of auditors' approval. On the other hand, an investor might be more interested in a financial statement with high relevance to better form his own opinion about future earnings and cash flows (Johnson, L. T., 2005).

Contrasting L. T. Johnson's notion that accounting information is both relevant and reliable at the same time, Bengtsson (2009) argues that accounting cannot fulfil both characteristics concurrently. Reliability is backwards looking; meanwhile, relevance strives to look forward into a firm's future cash flows. Similarly, relevance need not be a trade-off from reliability according to Balachandran and Mohanram (2011, 276) who claim that as "conservatism limits the introduction of information that cannot be reliably measured, increased conservatism might be associated with increased relevance". The authors allege that this is an essential finding in times where fair value accounting is achieving increased popularity among firms and standard-setters.

2.1.3 Accounting Information: A Powerful Commodity

The notion of information must be discussed to understand what value relevance of accounting information means. Information can be described as a "powerful and important commodity" (Scott, 2015, 14) and a signal from the producer of information to the receiver (Feltham, 1968). Important to note is that accounting information does not only comprise financial information, but non-financial information is an essential part of accounting (Amir & Lev, 1996).

The receiver of accounting information is a decision-maker who acts upon the information. To act upon information, it must be relevant, meaning that it is useful in decision-making by the receiver. Hence, the term *relevant information* is redundant since the latter includes the former (Feltham, 1968). Nevertheless, the term relevant information is regularly used in accounting research. However, a situation may arise where a receiver uses information that is irrelevant in a decision-making process, as explained by Graaf (2016). The use of such information is, according to Feltham (1968), worse than using no information at all.

Accounting information primarily consists of numbers and strives to provide financial realism. There is a normative demand for numerical representations which, in turn, opens up for so-called *creative accounting* where a firm's stakeholders demand the firm's accounting information to represent their reality (Vollmer, 2007). Thus, exploitation of accounting information could occur. However, as Vollmer (2007) emphasises, financial realism does not strive to separate which reality is right or wrong, but that the users of accounting information decide their collective reality.

Socea (2012) adds that the role of accounting information is to, inter alia, minimise complexity and uncertainty and to demonstrate risks and limitations of alternate actions and solutions. Accounting information enables the firm, and its managers, to simultaneously look in the rear-view mirror and, at the present situation and on that basis, form an opinion about the firm's prospects.

However, Scott (2015, 173) argues that the relevance and usefulness of information ultimately depend on the receiver. The meaning of relevance to an investor and a supplier is dissimilar. Feltham (1968) explains that stakeholders measure relevance by whether the information has a higher value than the cost of producing it. Consequently, the value of information is different for all stakeholders of the firm.

Firms are obliged to obey disclosure laws and thus produce information about themselves to stakeholders. The mandated information is not exclusively accounting information, and the produced information is not available to all stakeholders (Gonedes, 1975). A concern with information production is so-called overlapping production where two or more firms partially create the same information. This circumstance can be due to disclosure laws requiring all firms to produce the same information, which prevents optimal information production (Gonedes, 1975). If a firm is prevented from optimal production in one area, for instance, information production, the firm's investment and production decisions in other areas are affected as well.

Due to information being a public good, the market will produce the incorrect quantity. The production of information follows the law of supply and demand, which reaches an equilibrium where the equilibrium quantity is supplied and demanded. Social goods are often underpriced since the good is available to the public without a surcharge. Consequently, the price of a social good falls short of the equilibrium price of an efficient

market (Scott, 2015, 174). Due to the price being lower than the market equilibrium, a situation with excess demand is likely to arise.

A different view of information is that of *financial pragmatism* which Vollmer (2007) describes as a viewpoint that interprets numbers as an action rather than information. Financial numbers (information) possess three qualities: mobility, stability, and combinability that together enable action. Therefore, financial numbers are not merely the input in decision-making as described by Feltham (1968) but, instead, numbers are indicators that convey a future event in the present. For that reason, Vollmer (2007) argues that financial information defines another reality.

2.1.4 Measuring Value Relevance

There are different ways to measure the value relevance of accounting information. The measurement choice largely depends on who the stakeholder is. For instance, to measure the value relevance of accounting information to an equity investor, the capital market is frequently used as a measurement tool. Important to note is the fact that the value relevance of accounting information is not of interest to all stakeholders, but dominantly to stakeholders making investment decisions, accounting practitioners, and regulators (Badu & Appiah, 2018). Hence, the value relevance of accounting is multifaceted, since a higher value relevance for one stakeholder might mean a lower value relevance for another stakeholder.

Graaf (2016) states that value relevance has its roots in the efficient market hypothesis, which is why both accounting and finance have an interest in value relevance. It also explains why value relevance is frequently measured using capital markets. The earnings response coefficient is a popular and commonly used measurement of the value relevance of accounting information and, more specifically, financial reports. The preface, according to Scott (2015, 154), is that investors want to predict the value of a firm themselves instead of relying on secondary sources.

However, as Scott (2015, 154) underlines, the response of the capital market to the announcement of accounting information is limited because the accounting policy that maximises the value relevance measured via the capital market is not value-maximising

for all stakeholders. The reasoning is that, for instance, society could be worse off from a responsive capital market. However, a responsive capital market could provide positive externalities to other stakeholder groups within society.

Moreover, Ball and Shivakumar (2008) assert that the purpose of accounting information is not to influence the capital market. The purpose of accounting information, according to the authors, is periodic contract settlements. In addition, as accounting depicts a firm's history, accounting information is used to confirm previous information expectations.

Another value relevance measure is the relationship between accounting and analysts' forecasts. Graaf (2016) argues that this measurement is not tied to the capital market, but the usefulness of accounting information in decision-making. An analyst forecasts by using different information sources where accounting is only one source. If a firm releases new accounting information and analysts change their forecasts based on it, the accounting information can be considered value relevant. However, as Graaf (2018) points out, there exist role conflicts among equity market analysts who have to conform to opposing demands made by, for instance, colleagues, managers and fund managers. These role conflicts are demonstrated by analysts taking a professional role and not engaging in ways which may harm their relationship with the firm releasing accounting information. Consequently, problems may arise when measuring value relevance using analysts' forecast since role conflicts can be challenging to observe. Therefore, it can be problematic to conclude the value relevance of accounting information based on analysts' forecasts only.

Francis and Schipper (1999) describe a third relevance measure which focuses on whether the financial information includes variables that are used in equity valuation models. For example, if the income statement's earnings number can be used to predict future earnings, cash flows or dividends, the financial statement is regarded as value relevant. However, as the authors stress, this measurement does not measure relevance with a statistical association, and therefore, the generalisation of the result might be affected. On the contrary, Holthausen and Watts (2001) claim that valuation models and the relevance of accounting information have no connection because such models do not supply accounting theories.

2.1.5 The Value Relevance of Different Financial Statements

There is a widespread notion that accounting information has lost its value relevance (Balachandran & Mohanram, 2011; Collins et al., 1997). Francis and Schipper (1999) state that the value relevance of financial reports has declined in recent years and that the cause can partially be attributable to the technology revolution and an increasing number of high-technology firms. However, the authors underline that the historical loss of relevance does not mean that current financial statements are irrelevant or that the future of financial statements is predestined. Nonetheless, reported earnings could provide value relevance since they recap important firm activities throughout the fiscal year.

Since the purpose of the thesis is to investigate the value relevance of accounting information by utilising capital market information and, thus, describe the relationship between the announcement of a firm's financial statements and the market response, it is imperative to discuss the value relevance of different financial statements. Ball and Brown (1968) confirm that a firm's financial statements affect the firm's stock price but that the capital market turns to other information sources when pricing securities and, thus, raising the question of whether financial statements are value relevant or not. Therefore, it is necessary to explore the value relevance of different financial statements such as the income statement, the balance sheet, and the cash flow statement.

The income statement is a description of the firm's activities during a fiscal year. Huang and Zhang (2012) argue that the income statement can provide value relevance depending on the quality of earnings. Negative earnings or transitory earnings provide less value relevance since stakeholders have trouble assessing the actual performance of the firm. Nonrecurring items are often losses and of low quality, preventing stakeholders from understanding the earnings (Collins et al., 1997; Francis & Schipper, 1999).

Moreover, the growth level of the firm affects the value relevance of the income statement. A firm with a high growth level is usually increasing its assets, and significant discrepancies between book and market values can occur and, thus, reduce the value relevance of the firm's financial statements (Frank, 2002). Further, Collins et al. (1997) discuss that firms with large investments in intangible assets suffer from lower value relevance. High-technology firms expensing investments in intangible assets confuse stakeholders who experience difficulties interpreting the difference between expenses and investments when utilising the income statement only (Amir & Lev, 1996). Therefore,

Huang and Zhang (2012) claim that the income statement and balance sheet of a firm complement each other, since the reports provide different information which, when compiled, better discloses the firm's activities and its financial position.

The balance sheet is a description of a firm's assets and liabilities on a specific date of the fiscal year. Collins et al. (1997) argue that firms reporting nonrecurring items in the income statement or firms that report negative earnings will have a lower value relevance of its income statement while the value relevance of its balance sheet increases. Nonrecurring items reported in the income statement make the balance sheet more value relevant since nonrecurring items usually are costs occurring due to divesting activities (Collins et al., 1997). Therefore, according to the authors, the abandonment value is more value relevant in such a firm.

Further, Collins et al. (1997) state that it is difficult for a firm's stakeholders to interpret negative earnings and form a valid opinion about the prospects of the firm. The value relevance of such a firm's balance sheet increases while the value relevance of its income statement decreases. Huang and Zhang (2012) agree with Collins et al. that the balance sheet of a firm reporting negative earnings does de facto reveal signs of higher value relevance. The authors confirm that balance sheet line items provide value relevance to stakeholders, signifying that the balance sheet provides useful value relevant information to stakeholders, especially when the income statement is inconclusive.

Huang and Zhang (2012) find three balance sheet line items that provide the most value relevance to stakeholders: contemporaneous capital investment, the previous period's capital investment and the profitability change. Their finding refutes that all stakeholders of the firm will find these line items seemingly value relevant. However, it provides valuable insight into the overall value relevance of the balance sheet of a firm. The authors reveal that when the income statement provides insufficient information, as is the case when earnings are negative, or the firm has a short history such as a startup firm, the balance sheet functions as a directive tool in assessing the firm's financial position and prospects. That notwithstanding, Huang and Zhang (2012, 290) emphasise that "the usefulness of the balance sheet versus that of the income statement differs across firms, depending on a firm's maturity, its operational performance …, and economic environment". As a result, the balance sheet can be value relevant to one firm while being less value relevant to another firm.

The cash flow statement is a liquidity analysis of a firm and determines how the firm has generated and spent cash during the fiscal year. The cash flow statement is divided into three categories: cash from operating activities, cash from investing activities and cash from financing activities.

The cash flow statement can be regarded as an accurate and transparent depiction of a firm's performance since the statement is not subjected to the use of accruals, deferrals and allocations. On the contrary, the income statement can suffer from distortion due to the use of accruals and other non-cash accounting methods (Sloan, 1996). Examples of *extreme accruals* used in reported earnings are gains and losses of foreign currency translation adjustment and changes in accounting standards and marketable securities (Mostafa & Dixon, 2013). Hence, if the income statement suffers from a distortionary use of accruals, the cash flow statement could provide a more accurate representation of the firm's financial position and prospects. Similarly, however, there is a possibility that managers defer or pay off expenses early, distorting the cash flow statement and affecting the value relevance of the financial reports (Mostafa & Dixon, 2013).

Consequently, the cash flow statement supplements the income statement when assessing the value relevance of a firm's financial reporting. However, as put forward by Sloan (1996), this requires the stakeholder to be knowledgeable about the difference between cash and accrual accounting methods and, above all, to be able to isolate the various cash and accrual components of earnings.

Ultimately, the value relevance of different financial statements tends to depend on the circumstances regarding the firm's activities. However, it appears that value relevance increases when reports are viewed together (Huang & Zhang, 2012), especially in cases of an extremity (Mostafa & Dixon, 2013), when earnings are negative (Collins et al., 1997) or consist of nonrecurring items (Francis & Schipper, 1999), or if the firm has significant investments in intangible assets (Amir & Lev, 1996).

2.2 Earnings Response Coefficients

This section presents the earnings response coefficient, how it is measured, and the connection between financial reports and the capital market. In addition, criticism against the coefficient and its capital market connection is expounded.

2.2.1 The ERC and its Critics

The earnings response coefficient measures how the capital market reacts to unexpected earnings announcements (Martikainen, M., 1997). Scott (2015, 163) defines the coefficient as "[a]n earnings response coefficient measures the extent of a security's abnormal market return in response to the unexpected component of reported earnings of the firm issuing that security". Consequently, to calculate the ERC, a firm's abnormal share return is divided by the amount of unexpected earnings. By stating the ERC on a per euro basis or as a percentage, one can compare the ERC of different firms to each other and over time.

Deegan and Unerman (2011, 455) explain that the firm's expected future dividend cash flows can be discounted using the appropriate discount factor according to the specific firm-level risk to determine the theoretical share price of a firm. Since dividends typically are paid out from the firm's annual and retained earnings, dividends depend on accounting earnings. Thus, the firm's cash flows are a function of its accounting earnings and, therefore, the theoretical share price (P_i) of firm i can be denoted as

$$P_i = \sum_{t=1}^{\infty} \bar{E}_t / (1 + k_i)^t \quad (1)$$

where the aggregate future earnings per share ($\bar{E}$) is discounted using the firm-specific discount rate (k_i) at time t. According to Equation (1), a firm with higher expected future earnings will have a higher share price. Similarly, a firm with a lower discount rate or opportunity cost of capital will have a higher share price as well. Expected earnings reflect all available public information about the firm assuming a semi-strong form efficient market, and the announcement of new information will, consequently, affect the share price. Therefore, only new information about current and future earnings influence the share price.

Deegan and Unerman (2011, 455) explain this phenomenon by introducing the term *unexpected earnings*, which are calculated by subtracting expected earnings from actual earnings. Investors and other users of a firm's financial reports have already expected and considered the expected earnings of the firm and will, therefore, rectify their opinion based on unexpected earnings solely.

Unexpected earnings influence the share price of a firm and, thus, the wealth of the firm's investors. Deegan and Unerman (2011, 455) reveal the relation of the change in share price and the return (R_{it}) of the investor as

$$R_{it} = \frac{(P_{it} - P_{it-1}) + D_{it}}{P_{it-1}} \quad (2)$$

where ($P_{it} - P_{it-1}$) reveals the change in share price from time *t-1* to *t* along with any dividends received (D_{it}). Returns can be calculated using different holding periods. However, for shorter holding periods where dividends are not distributed, the return can be calculated by the change in share price only, thus excluding dividend payments. However, due to share price movements being affected by industry and market-wide movements, unexpected earnings cannot explain 100 per cent of the change in the share price.

Similarly, the market return can be calculated according to Ariff and Fah (2011) as

$$R_{mt} = \frac{(I_t - I_{t-1})}{I_{t-1}} \quad (3)$$

where ($I_t - I_{t-1}$) reveals the change in the market price index from time *t-1* to *t*.

Different methods are used when calculating the abnormal return (AR) of a security. Al-Baidhani et al. (2017a) explain that a market-adjusted return model can be used, which calculates AR as the difference between the return of the security and the return of the market index (Equation 6). Ariff and Fah (2011) describe another method called the risk-adjusted market model, where the Capital Asset Pricing Model (CAPM) is used. The risk-adjusted market model incorporates firm beta in the return calculation (Equation 5).

Deegan and Unerman (2011, 457-458) explain that the market model was developed by Fama in 1976. The model is based on the CAPM, which was put forward by Sharpe (1964), Treynor (1961, 1962), Lintner (1965) and Mossin (1966). The risk-adjusted

market model explains how the firm's risk-level linearly correlates to its expected return. The model is expressed by Fama as

$$R_{it} = \alpha_{it} + \beta_{it} R_{mt} + \mu_{it} \quad (4)$$

where R_{it} measures the share return of company i at time t in line with Equation (2). The variable α_{it} is a firm-specific constant at time t. However, α_{it} is excluded by Firth (1976) since certain US studies have proven it to be not significantly different from zero. The variable β_{it} signifies the firm-specific beta, which is a measurement of the level of systematic risk of a firm to the market index. Therefore, the beta of firm i indicates the covariance of firm i's share price movement to market-wide corrections. R_{mt} is the market rate of return from, for instance, a market index or a large diversified portfolio. The final independent variable, μ_{it}, is an error term capturing other market movements of firm i's security that depends on, for instance, the release of new accounting information. Consequently, μ_{it} captures the unexpected or abnormal return of the security.

Kothari (2001) explains that the market model is useful to capital market researchers since it discerns the risk-related return of the security ($\beta_{it}R_{mt}$) from the firm-specific one. Therefore, by using the firm-specific error term, it is possible to distinguish the return caused by the announcement of new accounting information from other, market-wide, movements and systematic changes. Additionally, Kothari (2001) argues that it is possible that the announcement of new information does not affect the error term, which can potentially mean two things: firstly, that the announced information is already anticipated or, even known, by the market and secondly, that the announced information merely is irrelevant. Beaver (1968) supports Kothari's argument and says that earnings contain potentially significant measurement errors and that the information content is out of date and already included in the share price.

Additionally, the market model (see Equation 4) can be combined with Equation 2 to compute the difference between the actual change in share price and the expected change, thus estimating the residual as is illustrated by Firth (1976) as

$$U_{it} = \frac{(P_{it} - P_{it-1})}{P_{it-1}} - (\alpha_i + \beta_i R_{mt}) \quad (5)$$

where the mean estimate of U_{it} is zero when there is no release of new information about the firm and the return of the firm is, consequently, the same as the return of the market.

Although, at times of earnings announcements, U_{it} is expected to have a mean different from zero, which captures the impact of the capital market's re-evaluation of the firm.

The market-adjusted return model provides an elementary estimation of abnormal returns and is expressed by Al-Baidhani et al. (2017a; 2017b) as

$$AR_{it} = R_{it} - R_{mt} \qquad (6)$$

where AR_{it} measures the abnormal return of security i at time t. R_{it} measures the return of the security as specified by Equation (2), and R_{mt} subtracts Equation (3) from the return of the security. That is, the market's return is subtracted from the security's return to compute the abnormal return of the security. The market-adjusted return model is used in this study. However, it is essential to note that Equation 6 provides a rough estimate of the actual abnormal return surrounding the earnings announcement. This thesis does not strive to provide a more profound definition of the expected return of a security, which is, thus, left for future research.

Holthausen and Watts (2001) express concern with measurements such as the earnings response coefficient that, according to the authors, overemphasises the association between earnings and stock returns. Value relevance cannot be a goal in itself. It must be related to something else. Furthermore, the authors add that there is a strikingly high risk of bias due to correlated omitted variables when a study fails to include the *right* independent variables explaining the association.

McGoun (1997) argues more critically than Holthausen and Watts that the connection between earnings and capital markets is flawed. Real finance is, in fact, *hyperreal finance*, which only refers to itself and non-economic variables. The author considers capital markets as a *hyperreal game* resulting from so-called casino capitalism with its fictitious money and immense speculation. Thus, to measure the impact of a real economic variable such as earnings on a firm's stock price is questionable.

2.2.2 Reasons for Differential Market Response

Previous research puts several explanations forward to explain different market responses to earnings announcements, many of which regard the characteristics surrounding the firm itself. Here follows a brief walkthrough of the most common explanations.

The capital structure of a firm explains the firm's equity and debt financing. Leverage measures the extent to which the firm is financed by debt, such as, bonds and credits. By increasing the leverage level, a more substantial portion of the firm's earnings goes towards managing the cost of debt (Scott, 2015, 164). Therefore, the position of stakeholders providing debt to the firm is strengthened. Consequently, a smaller portion of earnings goes to the firm's shareholders. Subsequently, the ERC, or similar measurement of the relationship between earnings and share returns, is expected to be lower for a highly leveraged firm in comparison to an equity-financed firm (Martikainen, M., 1997).

Additionally, M. Martikainen (1997) claims that the capital structure has a visible effect on the ERC of firms that report losses in their income statement. However, the ERC is expected to be low. Highly leveraged firms have higher systematic risk resulting in their discounted cash flows having a smaller net present value. Therefore, the valuation impact of such a firm is smaller.

The quality of earnings relates to the informativeness of earnings. However, problems occur when measuring quality in practice, since one must consider what quality or informativeness means and if it has the same meaning to all stakeholders of the firm. Therefore, a standard measurement of the quality of earnings is *earnings persistence,* which measures if the reported earnings can persist throughout time. Earnings persistence is measured according to three different levels: permanent persistence, transitory persistence, and zero persistence (Scott, 2015, 164-165).

Continuing with the highest level of persistence, that is permanent persistence, Li (2011) describes another measurement of the quality of earnings as the relation between current earnings and permanent earnings. If current earnings are in line with permanent earnings, the former is characterised as of good quality. Moreover, the author demonstrates that the quality of earnings can be measured using the firm's capital investment decisions, which indicate the management's view on the firm's future profitability. Overinvestments

reduce the quality of earnings because the predictability of future earnings based on current earnings is reduced.

A firm's growth opportunities affect the value relevance, according to M. Martikainen (1997), since a high-growth firm's earnings imply higher expectations about future cash flows. In other words, if a firm reports increased earnings, the firm's stakeholders will significantly increase their expectations about future cash flows. Similarly, reported losses have a substantial effect on the ERC among high-growth firms. In contrast, a change in earnings of a firm with lower growth opportunities will have a smaller effect on value relevance. Scott (2015, 168) explains M. Martikainen's argument that, although the income statement is a description of the firm's past activities and performance, valid conclusions can be drawn regarding the firm's prospects. High growth potential can be found in the income statement via, for instance, highly profitable investments that act as a signal about the overall capability and profitability of the firm.

Investors purchase and sell securities based on their ability and needs, but also in response to recommendations and forecasts made by equity analysts. Although individual expectations exist, they are influenced by the market consensus. Therefore, the similarity of investor expectations is a powerful force affecting the ERC. If expectations among investors are similar, they will collectively agree that reported earnings are either good or bad news and, thus, act upon the information and purchase or sell the security (Scott, 2015, 168). Consequently, the less variation in investor expectations, the higher the response of the ERC is.

Choi, Kang and Yoo (2006) confirm that there is a negative relationship between earnings forecast dispersion and the size of the earnings response coefficient. Reasons for the negative association include *earnings noise* and fundamental uncertainty. The authors add that forecast dispersion is an encumbrance to stakeholders who, therefore, must rely on their quest for information.

Deegan and Unerman (2011, 469) state that there is a positive relationship between the size of a firm and the firm's investor coverage and, thus, the larger the firm is, the more information circulates about the firm. As a result, financial reports of large firms generally contain less value relevant information than those of smaller firms (Collins et al., 1997). In practice, this means that much of the information in the financial report already is

accounted for in the security's price. Therefore, the ERC is believed to be smaller (larger) for large (small) firms.

The informativeness of price reveals that the firm's future value already is incorporated into the share price of the firm. Hence, the expression *prices lead earnings*, which suggests that already before the earnings announcement has been made, that information is included in the price (Scott, 2015, 168). Ball and Brown (1968) revealed empirically that this occurrence takes place as early as 12 months before the announcement. Consequently, if prices are informative, earnings announcements provide exiguous new value relevant information and, thus, the ERC is low.

2.3 Efficient Markets and Behavioural Finance

This section explains the theoretical assumptions of the capital market required to measure value relevance. Firstly, the efficient market theory adopted in this study is explained and, secondly, behavioural finance and prospect theory are described as an alternate view of the capital market.

2.3.1 The Efficient Market Hypothesis

An *efficient market* is a market that swiftly reacts to new information and where arbitrage is impossible (Deegan & Unerman, 2011, 447). Arbitrage is a situation where the price of an identical good is different in different markets and, as a result, one can purchase a good in one market and sell it for a profit in another market. Arbitrage in capital markets occurs when the market price of a security deviates from the present value of its future cash flows (Scott, 2015, 41). Therefore, in an efficient market, all publicly available value relevant information is considered and expected to be incorporated in the price of a security. However, the fact that the capital market is efficient does not mean that the price of a security is correct (Deegan & Unerman, 2011, 447). Consequently, the efficient market hypothesis has been developed to discuss the different levels of market efficiency.

The *Efficient Market Hypothesis* (EMH) is a hypothesis developed by Fama (1970) that the price of a security fully reflects all available information. Rossi (2015) explains that the EMH measures information efficiency. The EMH is based on three market conditions: information is available to everyone without a surcharge, trading securities are not subjected to transactions costs, and the significance of current information is established by all market participants (Fama, 1970).

The hypothesis is not assumed to be true by Fama. However, it is possible to find strong support from the data. As a result, the level of market efficiency is divided into three categories: weak form efficiency, semi-strong form efficiency, and strong form efficiency (Fama, 1970). Weak form efficiency is described by Rossi (2015) as when the current price of a security only contains information about previous prices. In other words, the current stock price is derived from the previous stock price and, thus, the price follows a so-called *random walk*. Malkiel (2003) explains the random walk as a price series in which successive prices of a security are a random walk from the previous price

Rossi (2015) continues by explaining the semi-strong form efficiency as an efficiency level when stock prices, additionally, fully incorporate publicly available information. The information includes a firm's financial reports and other information, which can be of financial and non-financial nature. When the market moves from semi-strong efficiency to strong efficiency, non-public (insider) information is included in the stock price.

The EMH does not always hold as evidence against it is found in several financial markets around the world (Kothari, 2001). For instance, Rossi (2015) sheds light on *calendar anomalies* which reveal that capital markets behave contrarily in different periods. Examples of discovered calendar anomalies include, but are not limited to, the January effect, the day-of-the-week effect and the turn-of-the-month effect.

This thesis relies on the assumptions made by the efficient market hypothesis since, without the EMH, the apparent link between earnings and stock prices is rejected (Deegan & Unerman, 2011, 448). Without accepting the EMH, the ERC and CAR cannot be assumed as valid measurements of the value relevance of financial statements. In this study, the Helsinki Stock Exchange (HSE) is regarded as semi-strong form efficient, which, according to Holthausen and Watts (2001), is a requirement for any value

relevance study. Kothari (2001) adds that post-announcement drift is a sign of an inefficient market. Due to evidence of post-announcement drift on the HSE found by Schadewitz and Kanto (2002), the market cannot be considered as strong form efficient. However, Nyberg and Vaihekoski (2014) argue that the efficiency of the HSE is increasing in due course.

2.3.2 Behavioural Finance and Prospect Theory

A proponent of efficient markets and the efficient market hypothesis is *behavioural finance*. An essential distinction between capital market research, such as the EMH, and behavioural finance, is that the latter is not only focused on the investor as the firm's stakeholder. Therefore, behavioural finance opens up the research area to more stakeholders, for instance, auditors and banks, involved in the decision-making process via financial statements (Deegan & Unerman, 2011, 446).

Statman (1999) adds that behavioural finance regards the individual's cognitive errors, imperfect self-control and shifting attitudes about risk. Therefore, behavioural finance investors are irrational when making investment decisions. However, to describe behavioural finance as based on psychology is incorrect, since *normal finance,* too, is based on psychology.

Prospect theory regards how investors view the certainty of a prospect outcome, and it posits that increased certainty results in increased loss aversion and desirability of profits. These characteristics result in a disposition effect among investors who prematurely sell winners and keep losers (Statman, 1999). Hirschleifer (2001) adds that investors dislike realising losses since it functions as a mental indicator of the investor's poor decision-making ability. Moreover, the author recognises a phenomenon of conservatism among irrational investors who diminishes new evidence and overprices the change of beliefs.

Further, according to prospect theory, investors suffer from *narrow framing* which inhibits them from realising the big picture by dividing investments into different portfolios (for instance a dividend portfolio and a retirement portfolio) while failing to realise each investment's effect on total wealth (Statman, 1999). In addition, prospect theory reveals how individuals react to small probabilities as if they are significant. This

behaviour is visible within the insurance industry, where insurance buyers ignore the seemingly small probabilities of disaster (Kahneman & Tversky, 1979). Consequently, prospect theory attempts to explain individuals' irrational behaviour where they disregard their expected utility function and undertake increased risk and costs due to mental mechanisms.

3 LITERATURE REVIEW

In this chapter, previous studies of the value relevance of financial statements are reviewed focussing on the earnings response coefficient and abnormal returns as the value relevance measurement. The research is divided into evidence from abroad and from Finland because the financial reporting legislation differs between countries, and the capital markets have different degrees of development and efficiency. Further, hypotheses are developed in line with previous research and the theoretical framework.

3.1 Evidence from Abroad

Ball and Brown (1968) study how capital markets react to the announcement of accounting information during the 1960s. Previously, researchers focussed on how accounting practises were conformed to different theoretical models without observing stakeholder behaviour. The authors maintain that the previous analytical approach had problems approaching the accounting figure net income since it comprises heterogeneous components and is the result of a set of procedures marking the end of the accountant's endeavour and, thus, is a meaningless number. Therefore, the authors invited empirics into the discussion about the value relevance of accounting information.

Ball and Brown (1968) use data of 261 US firms during 1957-1965 to regress net income on earnings per share and find that, on average, positive (negative) unexpected earnings are followed by a positive (negative) reaction of the share price. A noteworthy finding is that the share price response begins already 12 months before the earnings announcement due to annual earnings being untimely. The market already anticipates up to 90 per cent of the information content of annual earnings. The precipitous release of information occurs via, for instance, dividend announcements before the release of the annual report. Additionally, many a company releases pre-annual earnings reports before the actual report providing more information to the capital market.

Regarding the predictor of the reaction of the capital market, Ball and Brown (1968) find that net income is a better predictor of stock returns than are operating income or net income before nonrecurring items. However, the authors raise the question of which

accounting report is, de facto, useful to the capital market if the annual report is, as indicated, untimely.

A problem with previous ERC research is that different results have been found depending on the used method. Generally, two different methods have been used: firm-specific coefficient methodology (FSCM) and a single response coefficient for a sample of firms called the cross-sectional regressions methodology (CSRM). CSRM ignores inter-firm variations such as risk, growth and predictability and persistence of earnings (Teets & Wasley, 1996).

Teets and Wasley (1996) use random samples of US firms during 1971-1990 and find that firm-specific ERC estimations are about 13 times larger than pooled estimations. For instance, with price-scaled unexpected earnings, the FSCM ERC is 0.72 while CSRM ERC is 0.05. Comparable ERCs for unexpected unscaled earnings are 0.08 and 0.01, respectively. Therefore, the authors recommend that before pooling is done, researchers should investigate if firm-specific ERCs and abnormal earnings variances are equal. If equality is not found, no pooling should be done since it could lead to incorrect interpretations of the earnings response coefficient.

A plethora of previous studies has used data from the 20th century when regressing stock market returns on earnings announcements. Therefore, Beaver, McNichols and Wang (2020) use quarterly data of firms listed on the New York Stock Exchange, American Stock Exchange, and NASDAQ during 1999-2016. The authors find an increasing earnings response coefficient during the 21st century, with a decline during the financial crisis of 2007-2008. Additionally, they state that balance sheet and income statement items are value relevant and provide explanatory power to the regression model. Beaver et al. (2020) conclude that the information content of earnings has improved during the 21st century and earnings information has, thus, become more value relevant. However, the authors fail to provide an extensive explanation of why the market response has increased.

Patatoukas (2014) uses quarterly data during 1981-2009 of US firms and analyses the relationship between earnings and stock returns. The author regresses stock market returns on aggregate earnings changes and finds a tenuous insignificant earnings response coefficient of 0.02. However, it is noteworthy to understand that simple ERC regression

measures the net stock market reaction to earnings. Patatoukas (2014) expresses that the low ERC might be due to de facto that aggregate earnings incorporate cash flow information as well as discount rate information. Therefore, the combined effect might distort the ERC estimates. In order to improve the relation, the author adds variables to the regression model. After adding revisions in expectations of stock returns, risk premium, future inflation, and the real riskless rate, the explanatory power of the regression (measured as adjusted R^2) increases from -1 per cent to 43 per cent. The estimated ERC increases correspondingly from 0.02 to 3.08 and is significant at the one per cent level. Hence, Patatoukas (2014) states that information about discount rates and cash flows presented in quarterly financial reports do de facto provide value relevant information to the capital market.

Ariff, Fah and Ni (2013) study the ERC of OECD (Organisation of Economic Cooperation and Development) banks. Banks and financial organisations are different from other firms due to their income being primarily affected by the fluctuation of interest rates. In order to develop the methodology further, the authors include risk factors in the ERC regression model to control for various bank risks such as exchange rate risk, price risk, market risk, interest rate risk, and credit risk.

Ariff et al. (2013) use a sample of banks from eight European countries during 2000-2007 to exclude the global financial crisis. They find significant positive ERCs for all countries ranging from 0.103 to 0.308. On average, the ERC is 0.2, indicating that an increase in unexpected earnings of one monetary unit increases the abnormal return by 20 per cent. The explanatory power of the regression is low and, on average, 12.3 per cent. However, it is satisfactory in comparison to previous research. Ariff et al. (2013) include various risk factors as independent variables to investigate their explanatory power and find that by including risk factors in the regression model, the explanatory power increases to 20.8 per cent. However, not all risk factors are significant, but only exchange rate risk, interest rate risk, and credit risk have significance in explaining cumulative abnormal returns.

Al-Baidhani et al. (2017a) analyse the ERC of Malaysian firms during 2001-2014 and find that individual stocks have an ERC of approximately 0.10, meaning that for every euro of unexpected earnings, there is an increase of abnormal returns of 10 per cent. The authors use quarterly reports and an event window up to 40 days prior and 15 days after

the announcement day. Additionally, the study discloses that investors react rapidly to unexpected positive earnings while slowly to unexpected negative earnings.

Al-Baidhani (2018) explores the ERC of firms in Japan, the UK, Sweden, Switzerland, Malaysia, and Mexico during 2001-2014. The research is performed as an event study, and the sample includes both financial and non-financial firms. The author finds a surprisingly small ERC compared to the prediction of the value relevance theory. The ERC of emerging markets is 0.10 and of developed markets 0.02. However, by using the portfolio method, the estimate increases. The two emerging markets in the sample: Malaysia and Mexico, have a higher ERC compared to the developed markets. The ERC of emerging markets is 0.87 and of developed markets 0.30. Al-Baidhani (2018) argues that the reason for different ERCs between the two groups is the risk level as investors in markets with increased risk react more swiftly and strongly to unexpected earnings.

Moreover, previous studies have analysed how financial statements affect the cumulative abnormal returns of a firm. Primarily, there are two different regression models used in previous research: a price model and a return model. The price model uses share price as the dependent variable while the return model uses (abnormal) share returns. However, the price model is affected by scale effects, omitted variable bias, and heteroscedasticity, while the return model is not and, therefore, the return model is superior (Filip & Raffournier, 2010; Gjerde et al., 2011).

Easton and Harris (1991) analyse the relationship between cumulative abnormal returns and the earnings change and earnings level. The authors use a sample of US firms between 1969 and 1986. The results indicate that the earnings level provides more value relevance than the earnings change. Using univariate regression to regress abnormal returns on earnings, Easton and Harris (1991) find that the R^2 of the earnings level is 7.5 per cent compared to 4 per cent of the earnings change. Moreover, the authors perform a multivariate regression by including earnings change and earnings level and find an R^2 of 7.7 per cent, which suggest that the combined explanatory power is larger than the individual effects.

Liu and Thomas (2000) continue with the return model and regress abnormal returns on unexpected earnings to analyse the value relevance of earnings. The study is performed with 6,743 observations of US firms during 1981-1994. However, the authors develop

the previously used simple regression (see, e.g. Easton & Harris, 1991) into a multiple regression to increase the explanatory power of the model. Liu and Thomas (2000) state that simple regressions that estimate the ERC usually suffer from low explanatory power and biased estimates. The explanatory power of the regression increases from 14 to 38 per cent by including the persistence of earnings and discount rates as explanatory variables. Consequently, the value relevance of accounting information increases. In addition, Liu and Thomas (2000) find that losses make earnings less value relevant when measured via the R^2.

Gjerde et al. (2011) study the value relevance of Norwegian firms' annual reports during 1964-2004 by performing an abnormal return regression. The authors include the following explanatory variables to analyse value relevance: time index, firm size, a dummy for losses, intangible asset intensity, market return, and market volatility. Value relevance is analysed from an abnormal return regression via the explanatory power of the regression as well as the regression coefficients. The findings indicate that there is no significant time trend; that is, the overall value relevance has neither decreased nor increased during the period. However, the value relevance of earnings has increased, and firm size provides significant explanatory power.

Nichols and Wahlen (2004) study abnormal returns of US firms between 1988 and 2002 and analyse how earnings affect CARs and control for risk factors such as firm size. In addition, the authors study how cash flow information affects CARs. The results reveal that earnings are value relevant and can partially explain CARs; however, cash flow information is less value relevant than earnings. Moreover, Nichols and Wahlen (2004) explain that abnormal returns occur both before and after the announcement of the financial report, thus indicating that the US capital market is not fully efficient.

Ragab and Omran (2006) analyse Egyptian firms from 1998 to 2002 and study how investors regard the value relevance of the firms' financial statements. The authors perform a pooled regression by using an abnormal return model and find that the earnings level is value relevant, but the earnings change is not. However, the explanatory power of the model is merely 4.11 per cent, which suggests that other variables affect CARs.

Filip and Raffournier (2010) study whether the earnings of 48 firms listed on the Bucharest Stock Exchange during 1998-2004 are value relevant. The authors use a return

regression since price models suffer from econometric problems such as scale effects, omitted variable problems, and heteroscedasticity. Filip and Raffournier (2010) argue that less developed markets should, in theory, be less efficient and, thus, suffer from lower value relevance. The results indicate that emerging market firms or firms in transitional economies, such as Romanian firms, do not experience less value relevance of their earnings than firms in developed markets do. Filip and Raffournier (2010) find an R^2 of the earnings level of 25.4 per cent with substantial variation between years. In addition, the authors study how losses affect value relevance and concur that losses reduce value relevance.

3.2 Evidence from Finland

In this section, the value relevance of Finnish firms is analysed from the beginning of the 1970s. An understanding of the early Finnish stock market is required to understand previous research due to the Finnish stock market's substantial development in recent years. In addition, Finnish financial accounting laws and regulations have changed significantly during the 20th century.

During the 1970s through the 1980s, the Helsinki Stock Exchange (HSE) comprised 39 Finnish firms the majority of which were traded infrequently. Compared to neighbouring Nordic countries, the market capitalisation of Finnish firms was significantly lower. The total market capitalisation of the Stockholm Stock Exchange was, at the end of 1991, 73 billion ECU (European Currency Unit) while the capitalisation of the HSE was only 11 billion ECU (Martikainen, T., Kallunki, & Perttunen, 1997). The HSE suffered from a recession in the early 1990s but soon recovered with Nokia at its lead. Technological changes primarily affected the stock market during the beginning of the 21st century, and the Finnish stock market became more developed over time (Nyberg & Vaihekoski, 2014).

Finland's first Accounting Act came into effect in 1925, and the period before was characterised as a "wild field" (Virtanen, 2009, 365). The author explains that the Finnish Accounting Act has progressively become more controlling as taxation has grown important, and the state's need for control of firms has made financial reporting

increasingly essential. Virtanen (2009) adds that the most recent Finnish financial accounting reform occurred in 2005 when Finnish accounting legislation implemented IFRS/IAS norms, which require all Finnish-listed firms to prepare financial statements in line with the standards of IFRS or IAS. The background of Finnish financial accounting and the Finnish capital market is vital to bear in mind when discussing the value relevance of Finnish financial accounting. Consequently, evidence of increased or decreased value relevance of accounting information among Finnish firms may be the result of amended laws, updated regulations and standards as well as the changing capital market.

T. Martikainen et al. (1997) study earnings response coefficients of Finnish firms traded on the HSE during 1974-1989. The authors analyse reported earnings and earnings adjusted according to the recommendations provided by the Finnish Committee for Corporate Analysis (COC) and find that reported earnings reveal a stronger association with abnormal returns than COC-adjusted earnings. The authors find a lower earnings response coefficient of Finnish firms than is found by previous research of US firms.

Similarly, a lower adjusted coefficient of determination (R^2) is found in the sample of Finnish firms. T. Martikainen et al. (1997) report that the adjusted R^2 in the sample of reported earnings is 5.5 per cent and the adjusted R^2 of COC-adjusted earnings is 2.1 per cent. Therefore, reported earnings are favourable when calculating the ERC of Finnish firms. The authors report an ERC of reported earnings of 0.09, meaning that one euro of unexpected earnings results in a nine per cent increase in abnormal returns. Important to note is the fact that the authors conduct their study on an under-developed Finnish stock market. Hence, the development of the HSE could improve the association between the earnings response coefficient and the reported earnings.

Schadewitz, Kanto, Kahra, and Blevins (2005) continue the research by T. Martikainen et al. (1997) and use data from the HSE during 1985-1993. The authors define the Finnish stock market as an emerging market and study cumulative abnormal returns (CAR) of interim earnings announcements during a 61-day return period. The association of CAR with unexpected earnings and the degree of disclosure is investigated. Schadewitz et al. (2005) find that the HSE has little information leakage prior to earnings announcements and, thus, little pre-announcement drift. The ERC of firms reporting the expected amount of disclosure is 0.608 on the announcement day. However, the market reaction is rather slow and, hence, it reacts incrementally, which supports the theory of post-announcement

drift. The authors demonstrate that the market reacts slowly when a firm releases more information than expected, and the reaction is somewhat inaccurate.

Schadewitz and Kanto (2002) clarify that the existence of post-announcement drift on capital markets suggests that the market underutilises earnings figures. In a situation without any form of post-announcement drift, the price of a security would instantaneously adjust to a new price, which fully reflects all available known information. However, as stipulated by Schadewitz and Kanto (2002) and Kothari (2001), capital markets do, de facto, experience post-announcement drift.

Similarly, Booth, Kallunki and Martikainen (1997) demonstrate that the price response of Finnish stocks is delayed, especially when earnings are negative. The authors analyse 43 firms listed on the HSE during 1990-1993. During this period, Finnish firms focused heavily on tax considerations when preparing financial reports, partially explaining why the net income figure failed to provide value relevance. However, profit after financial income and expenses provides more value relevance in explaining abnormal returns.

Schadewitz and Kanto (2002) analyse the ERC's relation to the level of disclosure of financial statements. The authors use data during 1985-1993 from the HSE and interim reports in their analysis. The authors find an ERC that is not statistically significant on the announcement day of 0.26. When using an eleven-day event period, the authors find a statistically significant ERC of 1.06. Schadewitz and Kanto (2002) establish that if a firm's financial statements have inadequate disclosure, that is a deficient level of disclosure, the ERC is tiny or zero. However, a firm with a higher level of disclosure displays a stronger relationship between earnings and price, which indicates that high performance is not enough for the capital market, but sustainable and qualitative earnings are preferred and required. Since future earnings are discounted in the share price of today, the capital market demands information about the future. Notwithstanding the capital market's demand for such information, an increase in information causes the market to react more slowly, and post-announcement drift can occur.

Kanto and Schadewitz (2000) use the same dataset as Schadewitz and Kanto (2002) to analyse the relationship between the ERC and earnings with emphasis on the level of disclosure. The authors affirm that the essential information of earnings, viz. the value relevant information, is absorbed apace into the stock price at the earnings announcement.

However, a thorough analysis of a firm's financial statements takes considerable time and does not occur during the same time as the actual earnings announcement. Moreover, a firm's financial statements might be challenging to interpret due to the internationality of today's business environment (Kanto & Schadewitz, 2000).

Since Finnish firms can report using FAS or IFRS, the value relevance of accounting information could differ depending on the standard used. Jarva and Lantto (2012) analyse how the value relevance varies among firms that were obliged to switch from FAS to IFRS in 2005. The authors find that the switchover did not make accounting information timely or of better quality. Moreover, Jarva and Lantto (2012) argue that the adoption of IFRS does not significantly increase the value relevance of book values

3.3 Summary

To summarise previous studies, Ball and Brown (1968) were the first to acknowledge that accounting information induces capital market behaviour and, thus, it is possible to measure value relevance via the capital market. Consequently, they invited empirics into the discussion about the value relevance of accounting information. The authors study the US stock market during 1957-1965 and find that the share price response begins its adjustment up to 12 months before the earnings announcement.

Later, studies investigated the ERC of different stock markets during the 20th century. However, the earnings response coefficients during the 20th century are relatively low as expressed by, for instance, Beaver et al. (2020). Ariff et al. (2013) find, for example, an ERC of 0.2 of Asia Pacific Banks and Al-Baidhani et al. (2017a) an ERC of 0.10 of Malaysian firms. Nevertheless, ERCs are occasionally tiny during the 21st century, for instance, in the study of Patatoukas (2014) where the ERC of US firms is 0.02.

Studies of cumulative abnormal returns were reviewed to complement the ERC studies and increase the understanding of value relevance in practice. By using a multivariate regression model, one can analyse the value relevance of different financial statements. Gjerde et al. (2011) for instance, find that the value relevance of earnings has increased for 40 years among Norwegian firms and that the firm size provides significant

explanatory power; however, the overall value relevance of annual reports is stationary. In addition, Nichols and Wahlen (2004) find that cash flow information is value relevant and Filip and Raffournier (2010) argue that losses reduce the value relevance of earnings.

Next, ERC evidence from Finland confirms that the earnings response coefficient is lower than, for instance, in the US. T. Martikainen et al. (1997) find that the ERC of Finnish firms during 1974-1989 is 0.09. However, Schadewitz et al. (2005) find a higher ERC of 0.61 during 1985-1993. Therefore, varying earnings response coefficients could be due to changing legislation or the development of the Finnish capital market (Virtanen, 2009); however, the adoption of IFRS should not affect the ERC (Jarva & Lantto, 2012).

Moreover, previous research uses different methodologies when studying the ERC as accentuated by Teets and Wasley (1996). Two frequently used approaches are cross-sectional regression and firm-specific coefficients. Each method has its benefits and drawbacks but, ultimately, depends on which ERC measure the researcher is interested in observing. For instance, pooling allows the researcher to study the ERC of a portfolio of firms or a stock exchange *in toto*. Similarly, there are two different methods of analysing CARs, namely a price model and a return model. However, the price model suffers from econometric difficulties which the return model can overcome (Filip & Raffournier, 2010; Gjerde et al., 2011).

3.4 Development of Hypotheses

Having established a theoretical understanding of the value relevance of financial statements, its fundamental driving forces and connection to the capital market in conjunction with empirical evidence of the ERC and CARs from different markets, I develop hypotheses to test the value relevance of Finnish-listed firms' annual reports empirically.

The purpose of the study is to explore the value relevance of accounting information by describing the relationship between the announcement of a firm's annual report and the response of the capital market using the ERC. Further, the study's secondary purpose is to discover which are the factors explaining the cumulative abnormal returns of Finnish-

listed firms during 2014-2018 to improve the understanding of the value relevance of annual reports.

Previous studies have found a positive relationship between earnings and returns signalling that an increase in unexpected earnings increases abnormal returns (Ariff & Fah, 2011; Gjerde et al., 2011; Mahjoubi & Abaoub, 2015; Martikainen, T. & Ankelo, 1990). Consequently, the following hypothesis is developed to test the relationship between unexpected earnings and abnormal stock returns:

H1. Abnormal stock returns are positively correlated to unexpected changes in earnings of firms listed on the Helsinki Stock Exchange during 2014-2018.

However, Liu and Thomas (2000) underline that the simple ERC regression fails to control for other information included in the annual report and, thus, can be misleading. Nichols and Wahlen (2004, 269) add that the capital market uses information in a "complex and dynamic process", which explains why the regression model must control for other information as well. Consequently, the analysis is continued, as advised by Al-Baidhani et al. (2017b), to explore the value relevance of different components of a firm's annual report via a cumulative abnormal returns regression model. Therefore, the second through fourth hypotheses are:

H2. The cumulative abnormal return of HSE firms is significantly affected by components from the income statement.

H3. The cumulative abnormal return of HSE firms is significantly affected by components from the balance sheet.

H4. The cumulative abnormal return of HSE firms is significantly affected by cash flow components.

4 RESEARCH METHOD AND EMPIRICAL STUDY

In this chapter, the research method and the design of the empirical study are described. The data sample is explored, and the variables used in the study are defined. Finally, the validity of the study is discussed.

This study uses a quantitative research method. Bryman and Bell (2011, 27) explain that the quantitative method is deductive and tests theory in practice. Deductive theory poses that the researcher deduces hypotheses based on a particular domain. Similarly, the data-gathering process is driven by theory. An important aspect of quantitative research, according to Bryman and Bell (2011, 27-28), is that the researcher aims to quantify findings in contrast to qualitative research focussing on interpretation and constructionism. In addition, quantitative research expresses an objective and external reality and tries to exclude any bias, which is referred to as positivism (Bryman & Bell, 2011, 15).

4.1 Research Method

Two calculations are performed to study the value relevance of annual reports. Firstly, the earnings response coefficient is estimated for a sample of firms and, secondly, estimated cumulative abnormal returns are regressed against variables from the income statement and balance sheet as well as cash flow components to understand which the driving forces behind value relevance are, that is, what explains cumulative abnormal returns.

The first calculation is, predominantly, performed as an event study (Al-Baidhani et al., 2017a), where the relationship between earnings announcements and stock returns is explored. The investigated event is the earnings announcements of firms, which can be annually or quarterly announcements.

It is possible to use a market-adjusted return model or a risk-adjusted market model when estimating the expected return of a security to calculate abnormal returns. Al-Baidhani et al. (2017a) explain that the former estimates that the expected return of a security is the

same as the expected return of a market index or a portfolio incorporating the security. Thus, a direct relationship between the security and the market is assumed. The risk-adjusted market model is expressed as the Capital Asset Pricing Model (CAPM), which includes firm beta in the return calculation. In addition, there is a mean-adjusted return model. However, it is rarely used in ERC research. The market-adjusted return model is frequently used (Martikainen, T. et al., 1997); however, the risk-adjusted market model is used as well (Ariff & Fah, 2011; Kanto & Schadewitz, 2000).

Due to findings of post-announcement drift on the HSE (Schadewitz & Kanto, 2002) and minor signs of pre-announcement drift (Schadewitz et al., 2005), it is essential to calculate the cumulative abnormal return (CAR) around the announcement date. Otherwise, perhaps, the actual abnormal return of the earnings announcement is over- or understated. Previous research has used various event windows up to 12 months before the earnings announcement. However, the longer the event window is, the higher is the risk that other announcements occur within the event window affecting the share price (Schadewitz et al., 2005). For that reason, the event window should be short but long enough to capture the *true* market response.

When estimating unexpected earnings, there are two different approaches used in previous research: an OLS regression model and a naïve model. Ball and Brown (1968) explain that the regression model regresses the change in a firm's income against the average change of the market's income. If the earnings change in one firm deviates from the average change in earnings of the market, that part is considered unexpected. However, the authors criticise the model due to potential bias and violations of OLS assumptions. Therefore, a so-called naïve model, or sometimes called a seasonal random walk model (Kanto & Schadewitz, 2000), is put forward which is less econometric and modestly forecasts the earnings of next year to be the same as this year's earnings (Ariff et al., 2013). More recently, other approaches have emerged, such as using analysts' forecasts (Beaver et al., 2020); however, these require a more extensive data-gathering process.

Multiple regression analysis (MRA) makes four vital assumptions to ensure non-biased estimation of predicted values of the dependent variable. The regression model must be correctly specified and take on the correct functional form. The expected value of errors is zero $E[\varepsilon \mid x] = 0$ and, thus, the error term is normally distributed. Moreover, the error

term is homoscedastic Var [ε | x] = σ^2 meaning that the error term variance is equal for all combinations of x-values. Additionally, the model does not suffer from perfect multi-collinearity, where two or more independent variables are perfectly correlated (Djurfeldt & Barmark, 2009, 55, 60, 111). A concern when using panel data is serial autocorrelation where the error terms of one period correlate to the error terms of the next period, which prevents causal inference (Djurfeldt & Barmark, 2009, 213). Al-Baidhani et al. (2017a) infer that one could group firms into portfolios of country or sector to lessen the problem of errors in variables. However, Ariff et al. (2013) suggest using a more advanced panel or pooled time series regression.

On the contrary, Teets and Wasley (1996) argue that a cross-sectional regression methodology, which ignores variation in ERCs across firms, will likely provide a false ERC. Kothari (2001) adds that the ERC estimate of firm-specific observations probably is larger than the cross-sectional observations estimate. In addition, Junttila et al. (2005) advocate the use of a more refined fixed or random effects model. A time index or year-fixed effects can be used to control for a possible year effect (Niskanen et al., 2000).

Next, the second regression model can be performed as a price or an abnormal return model where factors affecting value relevance are studied. Filip and Raffournier (2010) explain that the price model studies the share price and earnings relation, while the return model studies the share return and earnings relation. The authors describe the price model as more forward-looking than the return model since more information is incorporated into the share price than in the share return. However, Gjerde et al. (2011) note that the price model suffers from econometric problems such as scale effects, heteroscedasticity and omitted variables. Therefore, the return model is preferred (Filip & Raffournier, 2010; Gjerde et al., 2011).

The regression model can include the earnings level, or the earnings change to measure how earnings affect either price or abnormal returns. A few studies have found that the earnings change significantly affects abnormal returns (Easton & Harris, 1991; Nichols & Wahlen, 2004), while some studies have found that the earnings level provides more value relevance (Filip & Raffournier, 2010; Ragab & Omran, 2006). In addition, explanatory variables can be included from, for instance, the balance sheet (Gjerde et al., 2011) and cash flow statement (Nichols & Wahlen, 2004) to analyse the value relevance of different financial statements.

4.2 Research Design

The H1 hypothesis of the study is that abnormal stock returns are positively correlated to unexpected changes in earnings of firms listed on the HSE during 2014-2018. In order to test H1, the ERC of these firms is estimated by the following calculations.

Firstly, abnormal returns are calculated according to the market-adjusted return model explained by Al-Baidhani et al. (2017a; 2017b) and, thus, abnormal returns are calculated as subtracting the market return from the return of the security. The abnormal return can be either positive or negative. The index used in the study is the OMX Helsinki All Share Index (OMXHPI: Helsinki Stock Exchange), which is calculated as a price return index value with no adjustment for extraordinary dividends. The index is weight capped, where the maximum weight of one share is ten per cent of the total market value of the index.

The return of a security, R_{it}, is calculated as

$$R_{it} = \ln(P_{it}) - \ln(P_{i,t-1}) \quad (7)$$

where $\ln(P_{it})$ is the logarithmic price of security *i* at time *t* and $\ln(P_{i,t-1})$ is the logarithmic price of the security at time *t-1*.

Similarly, the return of the market index, R_{mt}, is calculated as

$$R_{mt} = \ln(I_t) - \ln(I_{t-1}) \quad (8)$$

where $\ln(I_t)$ is the logarithmic index value at time *t,* and $\ln(I_{t-1})$ is the logarithmic index value at time *t-1*.

Then, the return of the market index (Equation 8), OMXHPI, is subtracted from the return of the security (Equation 7) to compute the abnormal return of the security. Consequently, the abnormal return is the difference between a firm's share return and the market's return (see Equation 6). The market-adjusted return model is used since stock returns are affected by general economic factors (Ragab & Omran, 2006). In addition, Brown and Warner (1980) claim that various AR-models perform similarly and that there are merely small differences in the different models' ability to detect abnormal returns. Moreover, firm-specific risk factors and characteristics are controlled for in Equation 12. However, this definition of abnormal returns provides an elementary estimation of ARs, and the

interpretation of the study's results is, therefore, preliminary and ought to be verified with further research.

Next, the cumulative abnormal return is calculated during an eleven-day event window CAR [-5, 5] as

$$CAR_{it} = \sum AR_{it} \quad (9)$$

where the abnormal returns of firm *i* are summarised for eleven trading days, that is, from day -5 to 5 where day 0 marks the release date. The release date of a firm's annual report is retrieved from the firm's website, and the return window is calculated five consecutive days before and after the release date to comprise the eleven-day event window. The return of the firm is then compared to the return of OMXHPI during the same trading days, and the CAR is calculated as the difference between the share return and the return of OMXHPI.

For illustration purposes, Kesko Oyj announced the release date of their annual report as a stock exchange release on their website on the 8th of March 2019 at 9:00 a.m. The announcement day (day zero) is, therefore, Friday the 8th of March 2019. Returns are summarised for five trading days after and before the announcement day. Therefore, the return of Kesko Oyj is summarised five days before the announcement day during 1.3.2019-7.3.2019, and five days after the announcement day during 11.3.2019-15.3.3019. Ultimately, the return of Kesko Oyj comprises eleven consecutive trading days between 1.3.2019 and 15.3.2019. The return of OMXHPI is then calculated and summarised during the same event window. The difference between the return of Kesko and the market return is the abnormal return. In this case, the cumulative eleven-day return of Kesko was 1.88 per cent and of OMXHPI 3.39 per cent. The cumulative abnormal return of Kesko is, therefore, -1.51 per cent, which is the difference between the cumulative returns.

By using an event window incorporating five days after the announcement, it is probable to ensure that the reaction of the stock market is captured. If the event window is extended, it is likely that the level of data noise increases (Schadewitz, Kanto, Kahra, & Blevins, 2002). Schadewitz et al. (2005) state that the event window that a researcher uses when measuring the ERC is a secondary decision since theory does not provide the best practice. That notwithstanding, the authors argue that, for instance, a 61-day event-

window is misleading, since the probability that small market anomalies are included increases when the event-window is extended.

Secondly, the naïve expectation model is applied as a measurement of unexpected earnings since it is considered the best unbiased approximation of unexpected earnings (Ariff et al., 2013; Ball & Brown, 1968). The difference in a firm's earnings between two years can be considered unexpected if earnings are fully persistent. Li (2011) claims that earnings are of good quality if they persist throughout time. If earnings have zero persistence, current earnings cannot be predicted based on the previous earnings level. Therefore, with the assumption that earnings are persistent, unexpected earnings can be calculated as the difference in earnings between successive years. That being said, all deviation from last year's earnings is not, necessarily, unexpected but are treated as such due to the simplicity of the model's forecasts. However, by estimating expected earnings using, for instance, analysts' forecasts or another rigorous statistical model, different results may be found.

The naïve expectation model is expressed by Ariff et al. (2013) as follows:

$$UE_{it} = E_{it} - E_{i(t-1)} \tag{10}$$

where unexpected earnings at time *t* equal the difference between earnings time *t* and earnings time *t-1* for firm *i*. The earnings announcements used in the study are annual reports. The earnings measurement is earnings per share (EPS), which is calculated as net income divided by the number of outstanding shares.

Continuing with the Kesko Oyj example, the earnings per share of Kesko was 1.61 euros in 2018 and 2.60 euros in 2017. The unexpected earnings are, therefore, the difference of -0.99 euros. The database used in the study is comprised of 45 firms during 2014-2018 and eleven AR values and one UE value for each firm and year. The abnormal returns are summarised for each firm every year as a cumulative abnormal return measurement. Therefore, every firm has one comparable CAR and UE value every year, resulting in 225 firm-year observations of CAR and UE.

Thirdly, the earnings response coefficient is regressed with the following bivariate OLS-regression:

$$CAR_{it} = B_0 + B_1 * UE_{it} + e_{it} \quad (11)$$

where

CAR_{it} = the cumulative abnormal return of firm *i* at time *t* during an eleven-day event window

UE_{it} = the unexpected earnings of firm *i* at time *t* as earnings per share where B_1 is the estimated earnings response coefficient of the sample

e_{it} = the error term of firm *i* at time *t*.

The estimate of B_1 provides the earnings response coefficient of firms listed on the HSE *in toto* and, consequently, only one ERC estimate is predicted and analysed. The output is presented in Table 7 in section 5.2.2. The cumulative abnormal return measurement is CAR [-5, 5], which means that abnormal returns are summarised for eleven trading days, five days before and after the announcement day.

Furthermore, to analyse which factors affect CARs and to test H2-H4, cumulative abnormal returns are estimated using linear prediction from the fitted regression model (11). Consequently, firms-specific CARs are predicted each year between 2014-2018 and, thus, 221 individual CAR predictions are used in Equation 12 as the dependent variable CAR_{it}. Equation 12 is performed as an abnormal return model, which means that the dependent variable is CARs and not share price, as recommended by Filip and Raffournier (2010) and Gjerde et al. (2011). Equation 12 includes line items from the income statement, balance sheet, and cash flows to control for the variation in cumulative abnormal returns. The explanatory power of the regression model (R^2) and regression coefficients are analysed to assess the value relevance of annual reports.

The study uses panel data to perform a pooled multiple Ordinary Least Squares (OLS) regression to investigate how cumulative abnormal stock returns are related to annual reports of HSE firms according to the H2-H4 hypotheses below:

H2. The cumulative abnormal return of HSE firms is significantly affected by components from the income statement.

H3. The cumulative abnormal return of HSE firms is significantly affected by components from the balance sheet.

H4. The cumulative abnormal return of HSE firms is significantly affected by cash flow components.

The following pooled OLS regression is estimated to test hypothesis 2 through 4:

$$CAR_{it} = B_0 + B_1 * EARN_{it} + B_2 * LOSS_{it} + B_3 * ROI_{it} + B_4 * LMC_{it-1} + B_5 * INTAS_{it-1} + B_6 * MTB_{it} + B_7 * GEARING_{it} + B_8 * WC_{it} + B_9 * TIME_t + e_{it} \quad (12)$$

where

CAR_{it} = the predicted cumulative abnormal return of firm *i* at time *t*

$EARN_{it}$ = earnings before extraordinary items of firm *i* at time *t* in 1000 euros scaled by the market value of equity at the beginning of each year

$LOSS_{it}$ = a dummy variable assigning the value one if firm *i* made a loss during time *t* and zero if profit

ROI_{it} = the return of investment of firm *i* at time *t*

LMC_{it-1} = the logarithmic market capitalisation of firm *i* at the beginning of time *t*

$INTAS_{it-1}$ = intangible assets divided by total assets of firm *i* at the beginning of time *t*

MTB_{it} = the market-to-book ratio of firm *i* at time *t*

$GEARING_{it}$ = the gearing ratio of firm *i* at time *t*

WC_{it} = the working capital (%) of firm *i* at time *t*

$TIME_t$ = the time index where time is 0 for 2014, 1 for 2015, … 4 for 2018

e_{it} = the error term of firm *i* at time *t*.

One pooled OLS regression is performed with Equation 12 using CAR predictions from Equation 11 as the dependent variable, and output is presented in Table 8 in section 5.2.1. Regression 12 is performed with a dataset comprising 221 firm-year observations, which

include 45 firms and their cumulative abnormal returns during an eleven-day event window around the release of the annual report every year between 2014 and 2018. Continuing with the Kesko case, the predicted cumulative abnormal return values from Equation 11 during an eleven-day event window surrounding the release of the annual report are used as the dependent variable. In other words, the CAR is predicted for Kesko every year between 2014 and 2018, which means that every firm has five CAR predictions. The total dataset comprises five observations for every firm, which equals 225 observations less four outliers.

The regressions are performed with Newey-West standard errors to guard against heteroscedasticity and autocorrelation among time series annual report data (see Table 4 and 5 for correlation tests, and Table 7 and 8 for applied Newey-West standard errors). Heteroscedasticity means unequal variability and leads to reduced predictability of the regression model (Djurfeldt & Barmark, 2009, 60). Autocorrelation means that the variable's value one year is correlated to the variable's value the previous year (Djurfeldt & Barmark, 2009, 155). Therefore, if autocorrelation is present, the variable's value can be explained simply by its lagged value. Consequently, it is essential to acknowledge the presence of autocorrelation in panel data to ensure causal inference is possible.

Djurfeldt and Barmark (2009, 223) state that if share prices are assumed to follow a random walk, the current share price equals the previous day's price plus a random walk. Therefore, since there is no regression towards the mean, the variation within the variable is expected to increase with time. As a result, Newey-West heteroscedasticity and autocorrelation consistent (HAC) standard errors are used. Newey-West assumes that the correlation between observations reduces while the distance between them increases and is, thus, a robust estimator (Newey & West, 1987).

Millo (2017, 4) explains that the Newey-West estimator takes the White estimator and "adds a sum of covariances between the different residuals, smoothed out by a kernel function giving weights decreasing with distance". Newey and West (1994) explain that the kernel signifies how the autocovariances are weighted. The authors add that a researcher has multiple options when choosing the appropriate kernel. However, the choice is secondary to the truncation lag. To implement Newey-West standard errors, one must decide the truncation lag (L) and the general rule of thumb, according to the authors, is $L = T^{1/4}$ where T is the sample size. Newey and West (1994) explain that the truncation

lag (also referred to as bandwidth) indicates how many autocovariances are included in the regression model. The sample of the study includes 221 firm-year observations, and the truncation lag used in the study is, therefore, four (rounded off).

4.3 Data Sample

The study uses panel data, which is pooled across sample firms and years. Panel data is cross-sectional data with a time dimension and, thus, follows the same units over time, which enables an increased possibility of causal inference (Djurfeldt & Barmark, 2009, 203). Parent companies' annual reports are gathered from the Voitto+ database and include firm-specific observations of firms listed on the Helsinki Stock Exchange during 2014-2018. The following items are collected from the Voitto+ database: earnings before extraordinary items, net profit or loss, intangible assets, total assets, gearing, return on investment and working capital (%). Afterwards, earnings per share (EPS) information is collected from Börsdata during 2014-2018 (Börsdata, 2020). Further, the Nasdaq OMX Nordic website is used to gather historical share and index prices from 2015 to 2019, since annual reports are published at the beginning of the following year.

The initial sample includes 137 shares listed on the HSE large-, mid- and small-cap retrieved from the Nasdaq OMX Nordic website (2020). Like Schadewitz and Kanto (2002), if a firm has several shares listed on the HSE, the most frequently traded share is selected. Consequently, eight shares are removed from the sample. Further, firms within the financial and insurance industry are excluded, as suggested by Huang and Zhang (2012), due to different legislation and reporting requirements. Subsequently, 18 firms are excluded from the sample.

Additionally, firms are excluded from the sample if they are not listed during the complete time frame. As a result, 18 additional firms are excluded from the sample. Further, shares trading below four euros at the beginning of a year during 2014-2018 are excluded, as recommended by Huang and Zhang (2012), to minimise the impact of illiquid stocks and outliers. Consequently, 48 firms are excluded, and the sample includes 45 firms and 225 firm-year observations. R. A. Johnson and Wichern (1997, 132) postulate that outliers can produce large residuals and, thus, significantly affect the regression model. Therefore,

it is recommended to remove outliers if they are not part of so-called unusual cases, which would result in new insights. Consequently, four outliers are identified and removed from the sample and, ultimately, the sample consists of 221 firm-year observations.

Kim and Ji (2015) claim that there is no general rule when deciding the appropriate sample size. Nevertheless, the authors argue that the sample size affects the level of significance used in the study. If the sample size is large, there is an increased risk of spurious significance levels, and insignificant results appear significant. On the contrary, small samples have the opposite effect, and significant results are treated as insignificant when using traditional significance levels (p-values 0.01, 0.05 and 0.10).

Consequently, Kim and Ji (2015) emphasise that the significance levels of small samples must be increased to reduce the probability of accepting a false null hypothesis. Therefore, the highest accepted significance level of this study is increased from a p-value of 0.10 to 0.11 (see Table 7 in Chapter 5.2 for the implemented increased significance level and its interpretation). However, the small sample of the study prohibits causal inference. The threshold change in p-values is done in response to the regression output and is, therefore, done on an *ad hoc* basis. It is noteworthy to emphasise that this thesis does not strive to cover the statistical procedures for revising p-values in response to different sample sizes.

4.4 Variable Definitions

Herewith follows a description of the dependent and independent variables used in the regression analysis. Dependent and independent variables in Equation 11 and 12 are presented.

4.4.1 Dependent Variables

A dependent variable is an endogen variable, which means that independent variables explain its value (Djurfeldt & Barmark, 2009, 58). Important to note is the fact that variables are measured, and with measurement comes measurement errors. Thus, an accounting variable's numerical value contains the real value in addition to the error term,

which can be of either random or systematic nature. Random errors have an expected value of zero and are serially independent, while the opposite is true for systematic errors (Ryan, Scapens, & Theobald, 2002, 119).

The dependent variable used to test H1 is cumulative abnormal returns (CAR). Cumulative abnormal returns are measured as CAR [-5, 5], that is, an eleven-day event window, where day zero marks the day of the announcement. Then, to test H2, H3 and H4, the CAR predictions from Equation 11 are used as dependent variables in Equation 12.

4.4.2 Independent Variables

The independent variable is the variable that the researcher manipulates. The researcher studies how the independent variable affects the dependent variable (Ryan et al., 2002, 118). When including an independent variable *ceteris paribus*, the researcher controls for variation in the dependent variable via the independent variable. However, the level of control varies depending on research characteristics and is usually lower in empirical financial and accounting research (Ryan et al., 2002, 122).

One independent variable is included in the regression analysis to test H1. The independent variable used in the ERC estimation regression (11) is unexpected earnings (UE) measured as earnings per share.

The independent variables used in the second regression (12) to test H2, H3 and H4 include variables from the parent company's income statement, balance sheet and cash flows. The independent variables from the income statement include the following: Earnings is measured as earnings before extraordinary items (EARN) (Balachandran & Mohanram, 2011; Beaver et al., 2020) in thousand euros and scaled by the market value of equity at the beginning of each year (Huang & Zhang, 2012). Additionally, a dummy variable (LOSS) for profit and loss is used to divide earnings into profits and losses since the value relevance of losses is anticipated to be lower than that of profits due to the temporary nature of losses (Martikainen, T. et al., 1997). The dummy assigns the value 1 for a loss and 0 for a profit. In addition, Huang and Zhang (2012) argue that share returns are affected by the firm's profitability because it aids investors in assessing the firm's

prospect profits and should, therefore, be included in the model. To measure profitability, return on investment (ROI) is calculated as earnings before extraordinary items plus expenses of liabilities divided by the balance sheet total of the previous balance sheet less interest-free debts.

The independent variables from the balance sheet are the following: As a proxy for firm size, the natural log of market capitalisation in thousand euros (LMC) at the beginning of each year is used as suggested by Gjerde et al. (2011) and Nichols and Wahlen (2004) since it has significant explanatory power of returns. In addition, Kwon (2018) asserts that accounting variables regarding firm value are value relevant. Further, intangible assets divided by total assets at the beginning of the year (INTAS) are included, as recommended by Collins et al. (1997), since technology-based firms' earnings and cash flows appear less value relevant (Amir & Lev, 1996). As a growth proxy, the market-to-book ratio (MTB) is used as advised by Frank (2002). Theoretically, a high growth level should lead to increased value relevance since it signals increased future cash flows and earnings (Martikainen, M., 1997).

A measure of risk should be included in the regression model to account for different risk levels among firms in the sample. Kothari (2001) discusses that it is possible to measure risk via leverage, and M. Martikainen (1997) adds that increased leverage results in increased systematic risk. The leverage measurement used is a gearing ratio (GEARING), which is calculated as interest-bearing liabilities less cash and marketable securities divided by equity. A gearing ratio below one is regarded as satisfactory.

A cash flow measurement is included as proposed by Nichols and Wahlen (2004). The included measurement is working capital as a percentage of revenues (WC) since it is the only cash flow indicator provided by the Voitto+ database. WC is measured as a percentage as working capital less trade payables and advances received divided by net sales (12 months). WC indicates a firm's short-term liquidity and how fast assets are converted into cash.

Additionally, Beaver et al. (2018) argue for a time index to be included because financial statement information is expected to follow a time trend. Therefore, a time index (TIME) is included where time equals 0 for 2014, 1 for 2015, … 4 for 2018.

4.5 Validity

In quantitative research, validity is of great importance and is defined by Bryman and Bell (2011, 159) as "whether or not a measure of a concept really measures that concept". Therefore, validity is an essential component of research, which renders causal inference possible. Moreover, validity can be divided into internal and external validity.

4.5.1 Internal Validity

Internal validity measures if the research model's independent variables truly affect the dependent variable (Ryan et al., 2002, 122). Moreover, Ihantola and Kihn (2011) explain that internal validity ensures that the research design is based on theory and built on previous research. High internal validity, consequently, means that a change in the dependent variable is due to changes in independent variables and not due to changes in variables outside of the model (Ryan et al., 2002, 122). Thus, internal validity is crucial for causal inference. In the research design of this study, it is ensured that it is based on value relevance theory and research. As a result, internal validity is ensured.

Another vital aspect of internal validity is the fact that it is primarily affected by choice of research design, meaning that the researcher is in control of internal validity. Any bias in the sample or the independent variables will result in lower internal validity. Due to the objective of the research to maximise internal validity, any bias must be excluded for internal validity to be achieved (Ryan et al., 2002, 123).

4.5.2 External Validity

Another aspect of validity is external. Ryan et al. (2002, 123) explain that external validity regards the generalisation of the study's findings. A multiple regression model cannot predict values without the regression having external validity. Important to note is the fact that internal and external validity go hand in hand, suggesting that high internal validity means high external validity. However, as Ryan et al. (2002, 123) clarify, one cannot have both high external and internal validity at the same time, since, to optimise internal validity, the researcher usually forgoes external validity.

Consequently, the researcher must choose an appropriate level of both external and internal validity. Ryan et al. (2002, 123) suggest that the former is more important than the latter in applied research. Therefore, this study will emphasise external validity. The most crucial external validity bias is so-called *data-snooping*, which occurs when multiple studies use the same dataset and population (Ryan et al., 2002, 124). Therefore, one must be aware of significant false correlations arising from over-analysing the same dataset.

External validity threats are grouped into three categories by Ryan et al. (2002, 123-124). The first category regards the validity of the sample population, that is, the observations used in the study. The population can be divided into the target population and the accessible population. The target population is the population to which the study aims to generalise the findings. This population is usually substantial. The accessible population is the population used in the study. A lack of external validity within the accessible population is, generally, considered worse than in the target population, since the former affects the outcome of the study (Ryan et al., 2002, 123-124).

The second category regards time validity and depends on how timely the population is. There is a possibility that structural changes occur among the independent variables used in the study, which might affect the generalisation of the study due to timeliness solely (Ryan et al., 2002, 123-124). The third category involves environmental validity, which accounts for the fact that accounting is an international and global phenomenon and, thus, individual samples cannot be generalised to all markets. To increase the causality and ability to generalise, these three threats to external validity should be accounted for in the study (Ryan et al., 2002, 123-124).

The sample is delimited to discard firms with distinct characteristics, such as financial and insurance firms to account for the first threat. Nevertheless, the sample is still comprised of firms in different industries with market capitalisation sizes from large-, mid- and small-cap in order to enable generalisation. The sample is not randomised as encouraged by Ihantola and Kihn (2011) due to the small size of the HSE. However, spot checks have been done on data from Voitto+ and Börsdata. The information was compared to the annual report published on the firm's website.

The second threat is difficult to account for since the sample comprises historical accounting information and share returns and, thus, cannot be generalised to the present. Time validity is, therefore, a valid concern. To account for the third threat, environmental validity, the sample must be compared to samples of different markets or countries. However, since there is only one stock exchange in Finland, and the Helsinki Stock Exchange is, in many ways, different from other Nordic stock exchanges (Nyberg & Vaihekoski, 2014), the generalisation of the study's results is dubious.

This chapter explained the quantitative method used in the study to test the relationship between unexpected earnings and abnormal stock returns. The sample size and variables were described, and the regression models explained. The following chapter presents the results of the applied method.

5 EMPIRICAL RESULTS

As stated in Chapter 1, the purpose of the study is to explore the value relevance of accounting information via the earnings response coefficient and to discover which the factors are affecting the cumulative abnormal returns of Finnish-listed firms during 2014-2018. In this chapter, the empirical results of the study are presented together with descriptive statistics exploring data characteristics. Moreover, the hypotheses of the study are evaluated.

5.1 Descriptive Statistics

In this section, descriptive statistics are presented to describe the basic features of the data. Firstly, the distribution and normality of the data are discussed and, secondly, correlations between variables and multi-collinearity between regression predictors are evaluated. Heteroscedasticity is not reported, because the regressions are performed with Newey-West standard errors, which overcome potential heteroscedasticity and autocorrelation between variables.

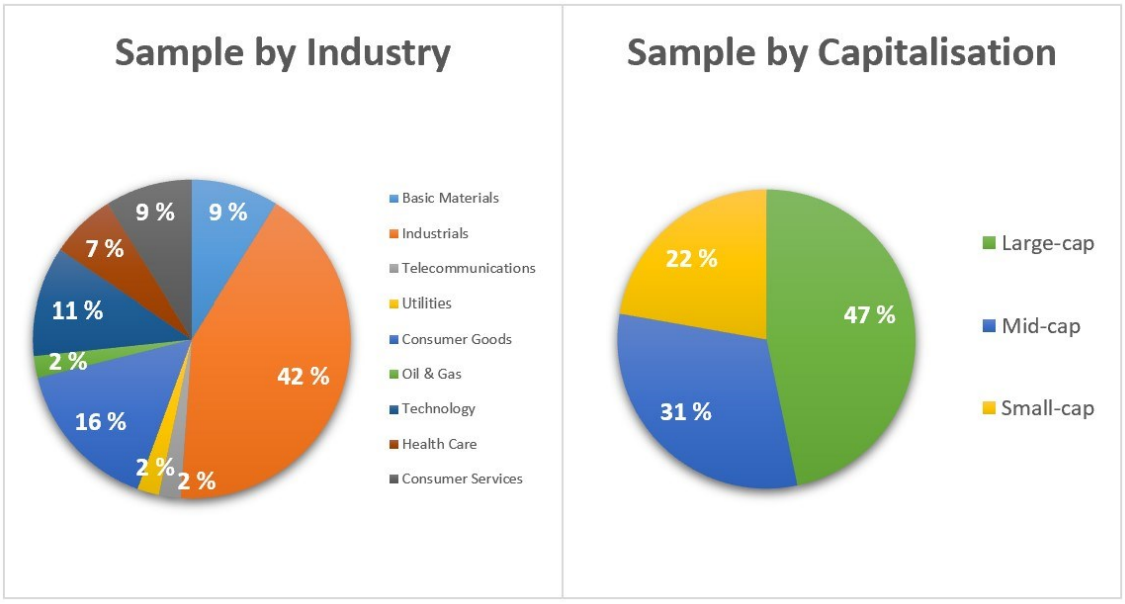

Figure 1. *Sample by industry (ICB) and market capitalisation size.*

A graphical representation of the sample is presented in Figure 1, where sample firms are divided into industries according to the Industry Classification Benchmark (ICB) codes

as well as their market capitalisation size. For a detailed list of sample firms, see Table A1 in the appendix.

Descriptive statistics are presented in Table 1. The measurement of the variables differs slightly. Variables with the symbol (%) are stated as a percentage. EARN measures the result before extraordinary items provided by the Voitto+ database and is, thus, expressed in thousand euros. Additionally, EARN is scaled by the market value of equity. LOSS is a dummy variable and, hence, only has the value of one or zero. The ERC is measured on a per euro basis since earnings per share data is used in its calculation. Consequently, an increase of one euro in unexpected earnings leads to a percentage increase or decrease in abnormal returns. LMC, the logarithmic market capitalisation, is measured using the natural logarithm in thousand euros.

Table 1. *Descriptive Statistics*

Variable	Obs.	Mean	Std. Dev.	Min	Max
CAR (%)	221	.004	.057	-.233	.197
UE	221	.079	.665	-2.92	2.70
E[CAR] (%)	221	.004	.006	-.022	.027
EARN	221	.040	.052	-.130	.315
LOSS	221	.086	.281	0	1
ROI (%)	221	.111	.129	-.282	.544
LMC	221	13.547	1.821	9.952	17.083
INTAS (%)	221	.031	.063	0	.361
MTB	221	1.758	1.597	.212	10.689
GEARING (%)	221	.439	.655	-.80	3.9
WC (%)	221	.206	.717	-.881	5.515

Note. CAR is cumulative abnormal returns (%) for 11 days, UE is unexpected earnings measured as earnings per share, E[CAR] is the estimated cumulative abnormal return, EARN is earnings before extraordinary items at the beginning of each year in thousand euros and is scaled by the market value of equity. LOSS is a dummy variable assigning the value one if the firm made a loss and zero if profit, ROI is the return on investment as a percentage, LMC is the natural logarithm of the market capitalisation in thousand euros at the beginning of time *t*, INTAS is intangible assets divided by total assets at the beginning of time *t*, MTB is the market-to-book ratio, GEARING is the gearing ratio (interest-bearing liabilities less cash and marketable securities divided by equity), and WC is working capital as a percentage of revenue.

5.1.1 Tests of Normality

This section explores the distribution and normality of the data sample. Measurements of skewness and kurtosis are presented, followed by the Shapiro-Wilk test of normality.

An essential assumption of OLS regression is normally distributed data, which means that the data sample used in a regression analysis must, approximately, follow the Gaussian curve (Djurfeldt, Larsson, & Stjärnhagen, 2010, 358). To explore whether the data sample is normally distributed, descriptive statistics of kurtosis and skewness are reported in Table 2. Skewness describes whether the distribution of a variable has a long tail in either direction and can be positive or negative (Djurfeldt et al., 2010, 56). Normally distributed data has a skewness close to zero and is, thus, symmetrical. Positive skewness indicates asymmetry and that the right-side tail is longer or fatter than the left-side tail (Doane & Seward, 2011).

Table 2. *Kurtosis and Skewness*

Variables	Obs.	p1	p99	Skewness	Kurtosis
CAR (%)	221	-.175	.162	-.387	6.043
UE	221	-2.44	2.19	-.486	8.252
E[CAR] (%)	221	-.018	.022	-.486	8.252
EARN	221	-.09	.181	0.93	7.371
LOSS	221	0	1	2.954	9.726
ROI (%)	221	-.187	.514	.812	4.754
LMC	221	9.999	16.991	-.009	2.036
INTAS (%)	221	0	.333	3.254	13.836
MTB	221	.244	8.271	2.775	13.089
GEARING (%)	221	-.8	2.7	1.699	8.104
WC (%)	221	-.582	4.403	5.244	34.616

Note. p1 describes the first percentile and p99 the 99th percentile. Skewness and kurtosis indicate the asymmetry of the probability distribution. CAR is cumulative abnormal returns (%) for 11 days, UE is unexpected earnings measured as earnings per share, E[CAR] is the estimated cumulative abnormal return, EARN is earnings before extraordinary items at the beginning of each year in thousand euros and is scaled by the market value of equity. LOSS is a dummy variable assigning the value one if the firm made a loss and zero if profit, ROI is the return on investment as a percentage, LMC is the natural logarithm of the market capitalisation in thousand euros at the beginning of time *t*, INTAS is intangible assets divided by total assets at the beginning of time *t*, MTB is the market-to-book ratio, GEARING is the gearing ratio (interest-bearing liabilities less cash and marketable securities divided by equity), and WC is working capital as a percentage of revenue.

Four variables are negatively skewed, including CAR, E[CAR], UE, and LMC of which UE and E[CAR] are the most skewed at -0.49. Regarding the positively skewed variables, a few stand out. The variable with the highest skewness is WC at 5.2, followed by INTAS and LOSS at 3.3 and 2.9. These three variables have a fatter right-side tail suggesting that many values are less than the median value. Taleb (2009) stresses that fat tails are the outcome of a single observation and are, therefore, problematic in forecasting, such as regression analysis. Probability distributions are hidden in real life, and only events are observable, and their distribution is known later. CAR and UE are used to estimate the ERC. However, they are both negatively skewed with thicker left-side tails. Taleb (2009) adds that the distribution assumption worsens as a result because a distribution with such a tail overestimates the mean and underestimates variance and risk. In addition, the lack of observations may cause an illusion of the absence of fat tails.

Table 3. *Shapiro-Wilk W test for normal data*

Variable	Obs.	W	V	z	Significance
CAR	221	0.954	7.581	4.688	0.000
UE	221	0.634	60.551	9.498	0.000
E[CAR]	221	0.891	17.697	6.644	0.000
EARN	221	0.891	18.096	6.702	0.000
LOSS	221	0.911	17.327	6.661	0.000
ROI	221	0.917	13.766	6.069	0.000
LMC	221	0.972	4.626	3.528	0.000
INTAS	221	0.510	95.138	10.639	0.000
MTB	221	0.724	45.669	8.845	0.000
GEARING	221	0.873	21.025	7.049	0.000
WC	221	0.158	93.180	10.486	0.000

Note. W is the Shapiro-Wilk test statistic, and V is an index for departure from normality where a normally distributed sample has a median value of 1. The z-value indicates how many standard deviations a value deviates from the mean and significance expresses the significance level. CAR is cumulative abnormal returns (%) for 11 days, UE is unexpected earnings measured as earnings per share, E[CAR] is the estimated cumulative abnormal return, EARN is earnings before extraordinary items at the beginning of each year in thousand euros and is scaled by the market value of equity. LOSS is a dummy variable assigning the value one if the firm made a loss and zero if profit, ROI is the return on investment as a percentage, LMC is the natural logarithm of the market capitalisation in thousand euros at the beginning of time *t*, INTAS is intangible assets divided by total assets at the beginning of time *t*, MTB is the market-to-book ratio, GEARING is the gearing ratio (interest-bearing liabilities less cash and marketable securities divided by equity), and WC is working capital as a percentage of revenue.

Another measurement of normality is kurtosis, which measures the flatness of the distribution. The kurtosis of a normal distribution is approximately three, which is called a mesokurtic distribution. A kurtosis above three, called leptokurtic distribution, reveals that the peak is high, and the tails are fat (Doane & Seward, 2011). Similarly, a negative value implies that the distribution is flat (Djurfeldt et al., 2010, 56). Kurtosis is reported in Table 2. A few variables attract attention. Like the skewness measurement, WC has the highest kurtosis of 34.6, revealing a vast leptokurtic distribution. Other variables with a leptokurtic distribution include INTAS and MTB with skewness of 13.8 and 13.1 respectively. For further measurements of normality, see Figure A1-A10 in the appendix.

To further analyse the normal distribution of the variables, the Shapiro-Wilk test is performed. The Shapiro-Wilk test has the capability of exploring the normal distribution of small data samples (Shapiro & Wilk, 1965) and is, therefore, applied to the study's data sample. The results are presented in Table 3. According to the Shapiro-Wilk test, the null hypothesis, that the data is normally distributed, is rejected. Therefore, the conclusion can be drawn that the variables used in the study are not normally distributed.

5.1.2 Tests of Correlation

Correlation measurements are calculated to explore covariation between variables, that is if a change in one variable leads to a change in another variable. However, correlation does not provide causal inference concerning the direction of the relationship (Bryman & Bell, 2011, 346). Therefore, causality cannot be derived from a correlation measurement. When dealing with interval or ratio variables, Pearson's r is recommended as correlation measurement. The coefficient takes a value between -1 and 1, where zero implies that there is no relationship between the variables. A negative value indicates that an increase in one variable leads to a decrease in the other variable. The opposite is true for a positive value. A correlation of one indicates a perfect correlation, which suggests that an increase in one variable leads to the same increase in another variable (Bryman & Bell, 2011, 347).

Pearson's r is calculated to test the correlation between the variables, and the results are displayed separately for variables used in the first and second regression. In Table 4, Pearson's r correlation coefficient of UE and CAR is 0.103. However, the correlation is not significant at any approved significance level. The correlation between the two

variables is weak, but positive, and suggests that an increase in unexpected earnings leads to an increase in cumulative abnormal returns.

Table 4. *Pearson's r Correlations*

Variables	(1)	(2)
(1) CAR	1.000	
(2) UE	0.103	1.000
	(0.127)	

Note. CAR stands for cumulative abnormal returns (%) for 11 days and UE for unexpected earnings measured as earnings per share. Correlation is calculated using 221 firm-year observations. The significance level is presented in parenthesis. * Shows significance at the .05 level.

In Table 5, Pearson's r correlation coefficients of the variables used in the second regression are presented. EARN is significantly correlated to E[CAR] by 0.335, which indicates that earnings move in the same direction as the cumulative abnormal return. LOSS is significantly correlated to E[CAR] by -0.241, indicating that a loss leads to a smaller cumulative abnormal return. In addition, LOSS is significantly and negatively correlated to EARN, since a loss implies negative earnings. Also, ROI is significantly correlated to E[CAR] (0.150), EARN (0.693) and LOSS (-0.353), which is expected. An increased return on investment suggests increased earnings, while a loss leads to lower ROI.

Moreover, LMC is significantly correlated to LOSS by -0.221, which suggests that a firm with a lower market capitalisation is more prone to losses than a firm with high capitalisation. A noteworthy finding is that the correlation between INTAS and ROI is significant (0.153), implying that the profitability of a firm increases as its ratio between intangible and total assets increases. As expected, MTB and INTAS are significantly correlated by 0.208, which proposes that a firm with increased intangible assets tend to increase its market value of equity. Moreover, the financial structure of the firm, GEARING, is significantly correlated to MTB by -0.304. Thus, as the debt level of the firm increases, the MTB ratio is predicted to decrease. Another finding worth mentioning is that WC is not significantly correlated to any variable in the sample. The highest correlation in Table 4 and Table 5 is ROI and EARN (0.693), which is close to, but below, the critical value of 0.7-0.8, which is considered a high correlation coefficient (Djurfeldt & Barmark, 2009, 113). However, without further analysis, no conclusions can be drawn.

Table 5. *Pearson's r Correlations*

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) E[CAR]	1.000								
(2) EARN	0.335*	1.000							
	(0.000)								
(3) LOSS	-0.241*	-0.416*	1.000						
	(0.000)	(0.000)							
(4) ROI	0.150*	0.693*	-0.353*	1.000					
	(0.026)	(0.000)	(0.000)						
(5) LMC	0.061	-0.071	-0.221*	0.126	1.000				
	(0.369)	(0.288)	(0.001)	(0.059)					
(6) INTAS	0.008	0.057	0.096	0.153*	-0.166*	1.000			
	(0.904)	(0.398)	(0.117)	(0.022)	(0.013)				
(7) MTB	-0.041	-0.152*	0.087	0.086	0.052	0.208*	1.000		
	(0.541)	(0.023)	(0.192)	(0.201)	(0.437)	(0.002)			
(8) GEARING	-0.023	-0.091	-0.083	-0.126	0.001	0.005	-0.304*	1.000	
	(0.729)	(0.172)	(0.215)	(0.060)	(0.994)	(0.942)	(0.000)		
(9) WC	-0.056	-0.039	-0.019	-0.063	-0.020	-0.039	-0.061	-0.024	1.000
	(0.410)	(0.563)	(0.779)	(0.350)	(0.771)	(0.564)	(0.361)	(0.719)	

Note. E[CAR] is the estimated cumulative abnormal return, EARN is earnings before extraordinary items at the beginning of each year in thousand euros and is scaled by the market value of equity. LOSS is a dummy variable assigning the value one if the firm made a loss and zero if profit, ROI is the return on investment as a percentage, LMC is the natural logarithm of the market capitalisation in thousand euros at the beginning of time *t*, INTAS is intangible assets divided by total assets at the beginning of time *t*, MTB is the market-to-book ratio, GEARING is the gearing ratio (interest-bearing liabilities less cash and marketable securities divided by equity), and WC is working capital as a percentage of revenue. Correlation is calculated using 221 firm-year observations. The significance level is presented in parenthesis. * Shows significance at the .05 level.

5.1.3 Tests of Multi-collinearity

Multi-collinearity measures the linear relationship between the independent variables in a regression model. If two or more variable coefficients have a linear correlation, this may result in inflated values and coefficients with incorrect signs. Multi-collinearity enables a researcher to investigate linear associations between multiple regression coefficients or predictors and is, therefore, different from the correlation presented in Chapter 5.1.2 (Johnson, R. A. & Wichern, 1997, 636).

Table 6. *Variance Inflation Factor*

Variable	VIF	Tolerance
EARN	2.56	0.39
ROI	2.22	0.45
LOSS	1.45	0.68
MTB	1.29	0.77
LMC	1.24	0.80
GEARING	1.18	0.84
INTAS	1.13	0.88
WC	1.06	0.94
TIME	1.03	0.97
Mean VIF	1.46	

Note. Variance Inflation Factor (VIF) and tolerance (1/VIF) of independent variables. A VIF below ten is considered satisfactory and demonstrates the absence of severe multi-collinearity. EARN is earnings before extraordinary items at the beginning of each year in thousand euros and is scaled by the market value of equity, ROI is the return on investment as a percentage, LOSS is a dummy variable assigning the value one if the firm made a loss and zero if profit, MTB is the market-to-book ratio, LMC is the natural logarithm of the market capitalisation in thousand euros at the beginning of time *t*, GEARING is the gearing ratio (interest-bearing liabilities less cash and marketable securities divided by equity), INTAS is intangible assets divided by total assets at the beginning of time *t*, WC is working capital as a percentage of revenue and TIME is a time index where time is 0 for 2014, 1 for 2015, … 4 for 2018. VIF is calculated using 221 firm-year observations.

The *variance inflation factor* (VIF) is calculated to measure the strength of the linear relationship. A variance inflation factor close to one indicates the absence of multi-collinearity, while a factor above one indicates a correlation, and an extreme value indicates an unstable variable. A rule of thumb concerning the variance inflation factor is that there is only a cause for concern when the mean VIF or a variable's VIF exceeds 10. Tolerance, measured as one divided by VIF, is used to investigate the degree of collinearity among variables. It is, essentially, the same measurement as VIF; however, a

tolerance value of 0.1 corresponds to a VIF value of 10 (Johnson, R. A. & Wichern, 1997, 636).

Variance inflation factors and tolerance are presented in Table 6. VIF is reported among independent variables and, therefore, the method cannot be applied to the first regression model, which merely has one independent variable. For that reason, Table 6 includes independent variables from the second regression only. When interpreting the statistics in Table 6, the regression coefficients are weakly correlated, since the majority has a VIF value near one. The variables EARN and ROI have a VIF value of 2.56 and 2.22, respectively, which are the highest reported values. However, the values notwithstanding, the variance inflation factors are not a cause for concern, since they are less than the critical value of 10. Consequently, the variables presented in Table 6 do not suffer from multi-collinearity and separate effects can, therefore, be estimated from individual explanatory variables.

5.2 Hypotheses

In this section, the empirical results of the study are presented. The results are divided into Hypothesis 1 and Hypotheses 2-4. The results of each hypothesis are reported separately, and the hypotheses are either accepted or rejected.

5.2.1 Hypothesis 1

The primary purpose of the thesis was to explore the value relevance of accounting information by describing the relationship between the announcement of a firm's annual report and the response of the capital market using the earnings response coefficient. Hypothesis 1 was developed as follows to fulfil the purpose of the thesis:

H1. Abnormal stock returns are positively correlated to unexpected changes in earnings of firms listed on the Helsinki Stock Exchange during 2014-2018.

Equation 11 was estimated through an OLS regression with Newey-West corrected standard errors to counteract possible heteroscedasticity and autocorrelation to test H1

(see Chapter 4.2 for Newey-West explanation). The regression output is presented in Table 7. Linear regression was performed to predict cumulative abnormal returns over an eleven-day event window (CAR [-5, 5]) based on unexpected earnings (UE). The predicted eleven-day cumulative return of a firm was 0.312 + 0.874 (UE) per cent. The earnings response coefficient was 0.00874 and, thus, an increase in unexpected earnings by one euro leads to an increase in cumulative abnormal returns of approximately 0.9 per cent.

Table 7. *OLS Estimates of Cumulative Abnormal Returns (%)*

VARIABLES	(1) OLS Model
UE	0.00874
	(0.00540)
Constant	0.00312
	(0.00409)
R^2	0.0106
Observations	221
Newey-West SE	YES

Note. The dependent variable is cumulative abnormal returns (%) for 11 days, and unexpected earnings (UE) measured as earnings per share is the independent variable. Newey-West standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

The regression was not found to be significant at any approved probability level ($F(1, 219) = 2.62$, $p<0.1070$). However, unexpected earnings had a p-value of 0.107, which can be accepted as significant due to the small sample size. Consequently, unexpected earnings can predict cumulative abnormal returns at the announcement of annual reports and Hypothesis 1 is accepted. The coefficient of determination (R^2) was 0.0106 and measured the strength of the linear relationship of the regression model. A robust linear relationship has an R^2 of one, and a weak linear relationship has an R^2 near zero. Therefore, the coefficient of determination explains how well the variation in the dependent variable is explained by the independent variables included in the regression model (Johnson, R. A. & Wichern, 1997, 577). Consequently, the explanatory power of the regression was weak, as unexpected earnings only could explain 1.1 per cent of the variation in cumulative abnormal returns.

5.2.2 Hypothesis 2, 3 and 4

The secondary purpose of the thesis was to discover which are the factors explaining the cumulative abnormal returns of Finnish-listed firms during 2014-2018 to improve the understanding of the value relevance of annual reports. Hypothesis 2, 3 and 4 were developed as follows to fulfil the purpose:

H2. The cumulative abnormal return of HSE firms is significantly affected by components from the income statement.

H3. The cumulative abnormal return of HSE firms is significantly affected by components from the balance sheet.

H4. The cumulative abnormal return of HSE firms is significantly affected by cash flow components.

A multiple linear regression (Equation 12) was performed to predict a firm's CAR based on components from its annual report. The variables EARN, LOSS, and ROI regard the income statement. LMC, INTAS, MTB, and GEARING regard the balance sheet. WC is the cash flow measurement, and TIME is the time index. The regression output is presented in Table 8. A significant regression equation was found ($F(9, 211) = 3.09$, $p<0.0002$) with a p-value below one per cent. The coefficient of determination (R^2) was 0.1714, which means that the linear relationship is rather weak. Consequently, the independent variables could not explain all variation in CARs. However, the F-value, which indicates the significance level of all independent variables, was significant at the one per cent level, indicating that the joint effect of the variables was significant.

To test H2, Equation 12 was estimated through an OLS regression with Newey-West corrected standard errors (see Chapter 4.2 for Newey-West explanation). Variables of interest regarding H2 were EARN, LOSS, and ROI. The variable EARN was significant at the one per cent level. However, LOSS and ROI were insignificant. EARN had a value of 0.0517, which means that for every increase of earnings measured in 1000 euros scaled by the firm's market value of equity, the CAR is predicted to increase by approximately 5.2 per cent. LOSS and ROI had negative values of -0.0018 and -0.00009, respectively. Therefore, if a firm reports negative earnings, the CAR is predicted to decrease by 0.18

per cent, and if ROI increases by one percentage point, the CAR is predicted to decrease by 0.009 per cent.

Table 8. *The Relation between Cumulative Abnormal Returns and Financial Statements*

VARIABLES	(1) OLS Model
EARN	0.0517***
	(0.0181)
LOSS	-0.00182
	(0.00214)
ROI (%)	-0.000092
	(0.000061)
LMC	0.000364**
	(0.000182)
INTAS (%)	-0.00412
	(0.00328)
MTB	0.000227
	(0.000197)
GEARING (%)	0.000063
	(0.000353)
WC (%)	-0.0000014
	(0.0000038)
TIME	-0.000587***
	(0.000204)
Constant	-0.00111
	(0.00251)
R^2	0.1714
Observations	221
Newey-West SE	YES

Note. The dependent variable is the CAR prediction from Equation 11. EARN is earnings before extraordinary items at the beginning of each year in thousand euros and is scaled by the market value of equity. LOSS is a dummy variable assigning the value one if the firm made a loss and zero if profit, ROI is the return on investment as a percentage, LMC is the natural logarithm of the market capitalisation in thousand euros at the beginning of time *t*, INTAS is intangible assets divided by total assets at the beginning of time *t*, MTB is the market-to-book ratio, GEARING is the gearing ratio, and WC is working capital as a percentage of revenue. TIME is a time index where time is 0 for 2014, 1 for 2015, … 4 for 2018. Newey-West standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Consequently, certain variables from the income statement, for instance, earnings before extraordinary items, can be used to predict CARs at the announcement of annual reports. Therefore, I can accept H2 that the cumulative abnormal return of firms is significantly affected by components from the income statement. However, as stated, all analysed variables from the income statement did not significantly affect CARs.

To test H3, Equation 12 was estimated through an OLS regression with Newey-West corrected standard errors (see Chapter 4.2 for Newey-West explanation), and the regression output is presented in Table 8. A multiple linear regression was performed to predict a firm's cumulative abnormal return based on its balance sheet. Variables of interest were LMC, INTAS, MTB, and GEARING.

LMC was significant at the five per cent level with a coefficient value of 0.000364; however, INTAS, MTB and GEARING were insignificant. LMC is measured as the natural logarithm of a firm's market capitalisation in thousand euros. Therefore, if LMC increases by one unit, the CAR is predicted to increase by 0.04 per cent. INTAS, which measures the intangible asset ratio, has a value of -0.00412, suggesting that the value relevance is decreasing as the ratio of intangible assets is increasing. MTB and GEARING have small coefficient values of 0.000227 and 0.000063, respectively. Nevertheless, the coefficients are positive suggesting that an increase in the market-to-book ratio or the gearing ratio leads to a higher CAR and, thus, higher value relevance.

Consequently, the balance sheet could be used to predict the CAR at the release of annual reports. Therefore, I can accept H3 that a firm's assets and liabilities significantly affect the cumulative abnormal return of firms. However, as stated, all analysed variables from the balance sheet did not significantly affect CARs.

To test H4, Equation 12 was estimated through an OLS regression with Newey-West corrected standard errors (see Chapter 4.2 for Newey-West explanation), and the regression output is presented in Table 8. A multiple linear regression was performed to predict a firm's cumulative abnormal return based on its cash flows. The variable of interest was WC. WC had a value of -0.0000014, suggesting that an increase in working capital as a percentage of revenues leads to a smaller CAR and lower value relevance. However, it was not significantly different from zero and, thus, H4 was rejected, since

working capital did not significantly affect the CAR of a firm in the sample.

Moreover, the time index was found statistically significant. TIME had a negative coefficient value of -0.000587, implying that the CAR and the value relevance are decreasing over time in the sample. However, the coefficient estimate was minimal.

5.3 Result Discussion

In this section, the results are discussed in the context of the study's purpose and compared to previous studies and the theoretical framework. Moreover, the limitations and validity of the results are reviewed.

The results from the first regression model provided evidence that there is a statistically significant relationship between unexpected earnings and cumulative abnormal stock returns of firms listed on the HSE during 2014-2018. The results confirmed that support of Hypothesis 1 was found in the data sample and, thus, H1 was accepted. The earnings response coefficient was significantly different from zero. However, the accepted significance level was a p-value of 0.107, which, according to Kim and Ji (2015), is enough for small sample studies, although, the small sample prohibits causal inference. Nevertheless, the regression model measures the net stock market reaction and, as expressed by Patatoukas (2014), the combined effect of different information sources might distort the ERC estimate. The ERC of the sample was 0.00874 (see Table 7) and, consequently, an increase in unexpected earnings by one euro is predicted to lead to an increase in cumulative abnormal returns of approximately 0.9 per cent during an eleven-day event window. Next, the results are compared to previous studies.

An ERC of 0.9 per cent is small in comparison to earnings response coefficients found in other samples. For instance, Ariff et al. (2013) found an ERC of 20 per cent among OECD banks. This study has excluded financial and insurance firms from the sample, which partially could explain the differences in ERC sizes. In comparison, however, Al-Baidhani et al. (2017a) found an ERC near ten per cent among Malaysian firms during the 21st century, but the sample included financial and non-financial firms. These findings shed light on the fact that different markets might behave differently. Findings from

previous Finnish studies must be compared to put the results in the context of the Finnish capital market. In addition, when comparing the results of the study to those of earlier studies, it is essential to bear in mind the evolving capital market and the updated accounting standards and amended legislation. However, the choice between the adoption of FAS or IFRS should not significantly affect the value relevance according to Jarva and Lantto (2012).

T. Martikainen and Ankelo (1990) found an ERC of 1.7 per cent, which is similar to the results of this study. However, the authors used data from 26 firms during 1975-1985. T. Martikainen et al. (1997) found an ERC of nine per cent and argued that the seemingly low ERC must be put in the context of a developing capital market and, thus, cannot be compared to similar US studies where the ERC usually is higher. In comparison, Schadewitz et al. (2005) found a remarkably high ERC of 61 per cent on the announcement day. The findings notwithstanding, they state that the HSE reacts slowly and somewhat inaccurately. Schadewitz and Kanto (2002) found a lower ERC of 26 per cent on the announcement day; however, the results are insignificant. The authors explain that a low ERC indicates that the disclosure level of the annual report is low. In contrast to recent studies, the size of the ERC found in this sample is relatively small. However, a few explanations are put forward.

Firstly, as declared by Ball and Brown (1968), annual reports are untimely since most firms issue pre-annual reports encapsulating plenty of information presented in the annual report. However, annual reports are audited and, therefore, can be considered more reliable than non-audited reports, although annual reports suffer from more earnings management than interim reports (Schadewitz & Kanto, 2002).

Secondly, due to post-announcement drift on the HSE as found by Schadewitz and Kanto (2002), the capital market may underutilise the annual report, which could explain the low ERC. In order to increase the ERC, a longer event window could be used; however, the risk of including market responses to other events increases. For that reason, it is more challenging to pinpoint the market's reaction to the announcement effect of the annual report if the event window is extended (Lev, 1989).

Thirdly, there is a concern regarding the disclosure level that is found in previous Finnish studies. Schadewitz and Kanto (2002) demonstrated that if a firm's financial statements

have inadequate disclosure, the ERC is tiny. Moreover, Schadewitz et al. (2005) argue that the HSE reacts incrementally to new information, and Kanto and Schadewitz (2000) explain that it takes time for stakeholders to interpret information, especially in the international landscape of today. Therefore, the small ERC can be due to firms disclosing insufficient information to stakeholders.

In addition, different methodologies result in different ERC estimates. Teets and Wasley (1996) found that cross-sectional ERC estimates are, usually, smaller than firm-specific coefficients. Possible explanations put forward by the authors are firm risk, growth and persistence of earnings. If these variables differ across firms, pooled ERC estimates could suffer. This study reports a cross-sectional ERC estimate, which might explain why the estimate is low. Nonetheless, the pooled estimate must be used to fulfil the purpose of the study and evaluate Hypothesis 1.

Furthermore, the theory does provide explanations for why the ERC is low. Primarily, capital market characteristics are put forward by Kothari (2001), who argues that low ERCs can be caused by inefficient capital markets, prices lead earnings, noise in earnings, and transitory earnings. It is important to note that the present evidence relies on a semi-strong form efficient market. Market efficiency is assumed for the ERC to function as a valid measurement of the relationship between earnings and the capital market because a semi-strong efficient market incorporates publicly available information into stock prices (Rossi, 2015). Nevertheless, concerns about the efficiency level of the HSE can still be put forward.

In addition, a low ERC can be explained by that prices lead earnings. The phenomenon implies that accounting information is already incorporated into share prices before the information is published (Scott, 2015, 168). In effect, this makes it challenging to observe the *true* ERC since it is difficult to estimate when information is incorporated into share prices. From this standpoint, the low ERC estimate indicates that information from the annual report already is published in earlier reports or leaked before the announcement of the official annual report.

Another explanation is noise in earnings and transitory earnings, meaning that firms report a biased income statement. Stakeholders have difficulties interpreting nonrecurring items and negative earnings, which leads to an over- or underreaction. A small ERC

implies that stakeholders underreact to annual reports. A similar conclusion was reached by Schadewitz et al. (2005). This is a potential explanation to the low ERC estimate found in the sample of Finnish firms since the ERC is measured using EPS as earnings measurement. Consequently, noise in earnings and transitory earnings could affect the ERC.

Moreover, the low ERC estimate raises concerns about measuring value relevance via the capital market. Concerns have previously been expressed by, for instance, McGoun (1997), who criticises the connection between accounting and capital markets. From his standpoint, it is indistinct to measure the impact of a real economic variable on a firm's stock price. The imperfect connection may be a reason why a low ERC estimate was found. However, it should be noted that lower ERCs are expected in Finnish or Scandinavian samples compared to US samples, as expressed by T. Martikainen et al. (1997). Furthermore, Virtanen (2009) emphasises that legislation amendments and the development of the Finnish capital market can affect stock market efficiency and, thus, lead to varying earnings response coefficient values. However, Nyberg and Vaihekoski (2014) argue that the efficiency of the HSE has increased during the 21st century.

The ERC regression (Equation 11) was found significant, which indicated that unexpected earnings could predict cumulative abnormal returns. However, the coefficient of determination (R^2) was low. Only 1.06 per cent of the variation in CARs could be attributable to unexpected earnings, although this is not a concern in ERC studies since it is a common feature of ERC models. Models using narrow windows have an explanatory power (R^2) between two to five per cent (Lev, 1989). In addition, Liu and Thomas (2000) state that simple ERC regressions tend to suffer from low explanatory power. Consequently, the low coefficient of determination is not a threat to the regression model's validity but indicates low value relevance.

Furthermore, the results from the second regression model (Equation 12) cast new light on which factors explain the cumulative abnormal returns of Finnish firms. The findings revealed that a firm's income statement and balance sheet were value relevant. Meanwhile, cash flow components were irrelevant. The study confirmed the findings of the value relevance of earnings by accepting Hypothesis 2. The results demonstrated that earnings before extraordinary items do explain the variation in cumulative abnormal returns (see Table 8), which is consistent with what has been found in previous studies

(Easton & Harris, 1991; Liu & Thomas, 2000). Huang and Zhang (2012) found that the income statement generally provides value relevance depending on the quality of earnings. The reason why the return on investment was found insignificant could, therefore, be the low quality of earnings. A dummy variable for profit or loss was included in the study to capture the effect of negative earnings. The findings indicated that income statements with reported losses were less value relevant than statements with profits, which is in line with the findings of Liu and Thomas (2000) and Filip and Raffournier (2010). However, the effect was statistically insignificant.

Following, the findings of the study supported the acceptance of Hypothesis 3. The findings concurred that a firm's balance sheet was value relevant. The market capitalisation had a significant effect on the cumulative abnormal returns (see Table 8). A similar conclusion was reached by Choi et al. (2006) who found that large firms have increasing stakeholder and investor coverage and, therefore, the firm's stock price reacts more swiftly to the release of annual reports. However, the findings failed to find supporting evidence that intangible assets, market-to-book ratio or gearing affected the CAR. Others, for instance, Sahut et al. (2011), have discovered that intangible assets are value relevant, especially if the assets are identified and not reported as goodwill. In addition, Frank (2002) found that the firm's growth level is negatively correlated to value relevance. Also, Nichols and Wahlen (2004) claim that the firm's risk level has an observable effect on a firm's CAR. Collins et al. (1997) discuss that the fluctuating value relevance of book values are explained by negative and transitory earnings as well as changes in average firm sizes. However, transitory and negative earnings as well as firm size are controlled for in the regression model and should, therefore, not be the cause of the conflicting results.

Next, the findings of the study supported the rejection of Hypothesis 4. The estimated coefficient of working capital was not statistically significant in the regression model (see Table 8). Mostafa and Dixon (2013) found evidence supporting the assumption that cash flow information is value relevant when combined with information about earnings. In addition, Nichols and Wahlen (2004) found that cash flows affect CARs, but Aboody et al. (2002) suggest that the capital market underreacts to cash flow information. However, contrary to the findings of Mostafa and Dixon (2013) and Nichols and Wahlen (2004), the study found no support that this assumption was correct in the sample. The absence

of support raises concerns about working capital as a cash flow measurement since cash flow information is regarded as an accurate and transparent depiction of a firm's performance due to the statement being withheld from the use of accruals, deferrals and allocations (Kothari, 2001).

Individual variable interpretations aside, the second regression model had an F-value that was significant at the one per cent level, which indicates that the combined effect of the variables is significant and can explain the variation in cumulative abnormal returns. However, the R^2 was relatively low. Only 17.14 per cent of the variation in CARs can be attributable to the independent variables. Nevertheless, low explanatory power was expected since the R^2 of previous studies is low (Easton & Harris, 1991; Filip & Raffournier, 2010; Ragab & Omran, 2006). The low R^2 suggests that there are additional factors or financial statement line items that explain the cumulative abnormal returns.

An unanticipated finding was that the cash flow measurement (WC) failed to verify value relevance in the study. Theory suggests that stakeholders and capital markets utilise cash flow information (Sloan, 1996), thus raising the question whether the research design was correctly specified and the population sample correctly drawn. These factors may be the reason why the study failed to find the cash flow measurement statistically significant; however, it remains unknown. That notwithstanding, the absence of evidence is not the evidence of absence.

The main limitation of the findings is the small sample size. The sample included 221 firm-year observations of 45 firms during five consecutive years. However, the Helsinki Stock Exchange is relatively small, and, for that reason, a larger sample requires an extended observed time range. Naturally, another limitation is the short time range. Larger sample size and an extended period may improve the results of the study. It should be noted that, although penny stocks were excluded from the sample, a few sample firms had illiquid stocks without daily trading activity, which might distort the cumulative abnormal return measurements. Moreover, the sample was not normally distributed, the data suffered from kurtosis and skewness, and a few variables had fat tails (see section 5.1.1. and Figure A1-A10 in appendix).

Furthermore, the study is limited by variable choice. The income statement, balance sheet, and cash flow statement consist of numerous line items, of which all could not be included

as independent variables in the regression model. Therefore, different results may be found by using other variables.

Moreover, the findings cannot be generalised to other stock exchanges due to exchange-specific characteristics, domestic legislation, and the small sample size. Similarly, generalisation to other samples of the HSE is not possible. However, the findings can be compared to previous research to understand the direction of the value relevance's development in Finland. That is if value relevance has increased or decreased over time. Compared to previous Finnish research, the ERC estimate found in this study was considerably lower, which implies that the value relevance of accounting information likely has decreased during the 21st century. However, from a statistical standpoint, the ERC was significantly different from zero (when considering the small sample size) and, thus, it is unlikely that the observed ERC is due to chance alone.

Although, it must be noted that due to the small sample size, it is not guaranteed that the correct probability distribution is observable as emphasised by Taleb (2009). As a result, the prediction accuracy of the regression models in decision-making is unclear, and the probability of being fooled by randomness should not be ignored. However, the results and the methodology are nonetheless valid for the study. The study used a positivist approach to explore whether stakeholders react to the release of annual reports. By analysing the reaction via the earnings response coefficient and cumulative abnormal returns, the purpose of the study was fulfilled.

6 CONCLUSION

In this chapter, a brief walkthrough of the thesis is presented. Findings and their implications for practice are discussed, and suggestions for future research are provided.

The study used a pooled OLS regression to explore the value relevance of accounting information via the capital market. The earnings response coefficient was estimated to describe the relationship between the announcement of a firm's annual report and the response of the capital market. Further, the study used a pooled OLS regression to discover which are the factors explaining the cumulative abnormal returns of Finnish firms.

An OLS regression was performed with Newey-West standard errors to fulfil the purpose of the study. Cumulative abnormal returns during an eleven-day event window were regressed against unexpected earnings measured as earnings per share. A short but sufficient event window was used to capture the *true* market response associated with the release of the annual report and minimise the probability of including small market anomalies (Schadewitz et al., 2005). Unexpected earnings were calculated using the naïve expectation model, which is the best-unbiased approximation of unexpected earnings (Ball & Brown, 1968). The predicted CARs from Equation 11 were regressed using a pooled OLS regression with Newey-West standard errors against variables from the income statement, balance sheet and cash flow statement to shed light on which factors explain the cumulative abnormal return.

The sample consisted of 221 firm-year observations of 45 Finnish firms listed on the HSE during 2014-2018, excluding the finance and insurance industry and firms traded under four euros per share. For a detailed list of sample firms, see Table A1 in the appendix.

The results reveal that there is a statistically significant positive relationship between unexpected earnings and cumulative abnormal returns. Nevertheless, the relationship is not causative, and causal inference cannot be drawn due to the small sample size. Furthermore, the ERC estimate is low, which can be interpreted as evidence of post-announcement drift and conservative accounting. Kothari (2001) argues that low ERCs indicate inefficiencies in capital markets because stakeholders overlook the impact of earnings. Similarly, Kanto and Schadewitz (2000) propose that plenty of information

published in the annual report already is known by the firm's stakeholders. However, without further research, it remains unclear why the coefficient is low. At the same time, it is essential to underline that the investor is one of many stakeholder groups, and careful consideration regarding other stakeholders must be made. Furthermore, Ball and Shivakumar (2008) assert that the purpose of accounting is not to influence the capital market, but to settle periodic contracts, to portray the history and confirm previous expectations about firm performance.

The statistically significant ERC implies that accounting information presented in the annual report is value relevant and is not only a result of the firm obeying laws and regulations, as suggested by Gonedes (1975). However, the usefulness and value relevance of accounting information differs among stakeholder groups (Holthausen & Watts, 2001), while the ERC measures value relevance primarily regarding investors. Rautiainen et al. (2017) emphasise that value relevance is measured regarding different stakeholder groups; however, it does not always transfer to the other groups. Therefore, although the findings indicate low value relevance to investors, other stakeholder groups may find the annual report more (or less) value relevant.

Moreover, the findings reveal that a firm's income statement and balance sheet provide value relevance, but cash flow information do not. Significant regression estimates were found in earnings before extraordinary items, market capitalisation and the time index. However, the regression model performs well and is statistically significant at the one per cent level, indicating that the combined effect of the variables can partly explain the variation in predicted cumulative abnormal returns. Therefore, the method used in the study to analyse CARs is valid.

An unexpected finding is that the cash flow component measured as working capital is not value relevant. However, the approach utilised suffers from the limitations that the sample size was small and the period short and, thus, the probability that regression towards the mean occurs must be acknowledged. In addition, the variable choice affected the results of the study, and different results might be found with other variables.

Although the findings indicate that the value relevance of annual reports is low, the annual report is still value relevant as suggested by the overall significance of the regression model. In contrast to previous studies, the results indicate a lower value relevance, which

implies that the value relevance of annual reports has decreased over time. However, the findings cannot be generalised due to exchange-specific characteristics, domestic legislation and sample firms. Consequently, there exists a constant need to explore the value relevance of accounting information continuously.

Increased awareness of the ERC and CARs can improve the understanding of voluntary disclosures in accounting (Kothari, 2001) and enable firms to make better financial reporting decisions by increasing the value relevance of their reports (Deegan & Unerman, 2011, 459). Nevertheless, one must remember that the ERC measures value relevance primarily to investors, but value relevance can be measured in multiple ways depending on the stakeholder. Accounting information that has value relevance to an investor could be of less relevance to a customer. Consequently, to measure value relevance, careful consideration must be made regarding which stakeholder is the focus of attention. Moreover, Rautiainen et al. (2017) argue that although researchers find instances where the value relevance of accounting information is low, it does not imply that accounting information, in general, is value irrelevant.

While previous research has primarily focused on the value relevance of a single financial report, for instance, the income statement, this study builds on Liu and Thomas' (2000) critique that a simple ERC regression fails to control for other information in the annual report and, thus, can be misleading. In addition, this study answers the call made by Al-Baidhani et al. (2017b) to explore the combined value relevance of the income statement, balance sheet and cash flow statement. The findings provide a new insight that accounting reports are value relevant when viewed together since the reports' line items partly explain the variation in CARs.

Further research is needed to establish how cash flow information affects cumulative abnormal returns. The cash flow statement can provide accurate, distortion-free, and value relevant information, and previous research has found cash flow information value relevant (Mostafa & Dixon, 2013; Nichols & Wahlen, 2004). However, less is known about the combined effect of cash flow information together with the income statement and balance sheet. This study strived to shed light on the combined effect of the financial statements, although, the results indicated that cash flow information did not provide value relevance. The results notwithstanding, further research should be conducted to

explore the combined effect since theory proposes that cash flow information is value relevant.

Moreover, the study used a simple definition of abnormal returns and unexpected earnings, and the results are, therefore, preliminary. Different results may be found using other rigorous measurements of abnormal returns and unexpected earnings. Consequently, the results ought to be verified with further research. In addition, as the financial and insurance industries are excluded from the sample, further research could be conducted to explore the earnings response coefficient and the cumulative abnormal returns of these firms.

7 SWEDISH SUMMARY – SVENSK SAMMANFATTNING

Externredovisningens värderelevans – en empirisk studie om finska företags earnings response coefficient och kumulativa abnormala avkastning

Redovisningens värderelevans kan mätas med en så kallad *earnings response coefficient* (ERC) (Scott, 2015, 153), som betecknar sambandet mellan ett företags finansiella rapporter och kapitalmarknaden genom att mäta hur företagets *oförväntade resultat* påverkar företagets *abnormala avkastning* på kapitalmarknaden (Campbell, 2018). Därtill kan ett företags kumulativa abnormala avkastning analyseras för att mäta värderelevansens drivkraft (Gjerde m.fl., 2011).

Redovisningens värderelevans är ett mångfacetterat begrepp som påverkas av flera faktorer och är kontextbunden till företagets olika intressenter. Värderelevansen påverkas bland annat av lagstiftning och marknadsfaktorer (Sahut m.fl., 2011), tillämpningen av olika redovisningsprinciper såsom internationell och nationell redovisningsstandard och kompromissen mellan relevans och tillförlitlighet (Barth m.fl., 2001). Kopplingen mellan kapitalmarknaden och redovisningsinformationen har sin grund i Ball och Browns studie år 1968 som empiriskt bevisade att redovisningsinformation påverkar kapitalmarknaden och därmed är till nytta för företagets intressenter (Kothari, 2001). Av den orsaken används ERC inte sällan för att mäta värderelevansen av redovisningsinformation.

Finsk redovisningsstandard karaktäriseras av konservatism och en stark koppling till skattelagstiftning, vilket leder till minskad överensstämmelse mellan nationell och internationell redovisningsstandard (Niskanen et al., 2000). Av den orsaken väcks frågor huruvida finska företags bokföring och årsbokslut är värderelevanta för företagets intressenter eller om redovisningsinformationen enkom är ett resultat av att företaget följer lagar och förordningar. Dessutom är produktionen av redovisningsinformation en kostsam process. Huhn (2019) framhåller att finska företag spenderade mer än 1,7 miljarder euro år 2017 på redovisnings- och revisionsrelaterade kostnader. Tillika utger finska börsbolag kvartals- och halvårsbokslut som fångar många av räkenskapsårets händelser (Schadewitz och Kanto, 2002), vilket ytterligare understryker frågan huruvida årsbokslutet kan erbjuda företagets intressenter värderelevant information. Dessutom går globaliseringen och den teknologiska utvecklingen skyndsamt fram, vilket bland annat leder till att flertalet företag gör stora investeringar i immateriella tillgångar, som kan ge

upphov till redovisningsproblem (Junttila m.fl., 2005). Den kontinuerliga förändringen skapar en ständig efterfrågan på att åter undersöka redovisningens värderelevans. Tidigare studier har fokuserat på värderelevansen av olika delar av externredovisningen, till exempel resultaträkningen (Francis och Schipper, 1999), balansräkningen (Huang och Zhang, 2012) och kassaflödesanalysen (Mostafa och Dixon, 2013), men den aggregerade effekten är ringa undersökt. Följaktligen finns ett behov att undersöka om dessa finansiella rapporter som tillsammans utgör årsbokslutet är värderelevanta för företagets intressenter. Därmed ställer jag upp följande hypoteser för att undersöka värderelevansen av årsbokslut:

H1. Det finns en positiv korrelation mellan ett företags abnormala avkastning och oförväntade resultat på Helsingforsbörsen 2014–2018.

H2. Ett företags kumulativa abnormala avkastning påverkas signifikant av poster från resultaträkningen.

H3. Ett företags kumulativa abnormala avkastning påverkas signifikant av poster från balansräkningen.

H4. Ett företags kumulativa abnormala avkastning påverkas signifikant av kassaflödesposter.

Studiens syfte är således att kartlägga förhållandet mellan publicerandet av företagets årsbokslut och kapitalmarknadens reaktion för att mäta om redovisningsinformationen är värderelevant för företagets intressenter. Därtill utreds vilka faktorer som kan förklara den kumulativa abnormala avkastningen av finska börsnoterade företag.

Studiens teori bygger på redovisningens värderelevans, kapitalmarknadsreaktioner och hypotesen om den effektiva marknaden. I studien beaktar jag värderelevans i enlighet med Graaf (2016) som anser att relevans måste sättas i relation till något annat. Dessutom tar jag parallellt hänsyn till konkretiseringen av värderelevansen efter Rautiainen m.fl. (2017) som menar att redovisningsinformation är värderelevant då den påverkar företagets värde. Ytterligare antar jag att Helsingforsbörsen har en mellanstark form av marknadseffektivitet, vilket enligt Holthausen och Watts (2001) är ett krav för denna typ av studie.

Den kvantitativa studien görs med OLS-regression i två delar. I den första delen estimeras en ERC av finska börsnoterade företag och i den andra delen används paneldata för att förklara variationen i kumulativ abnormal avkastning (CAR). På grund av möjlig heteroskedasticitet och autokorrelation används Newey-West standardfel i regressionsmodellerna (Newey och West, 1987). För att estimera ERC kalkyleras varje företags abnormala avkastning vid publikationen av företagets årsbokslut. Den abnormala avkastningen är skillnaden mellan företagets och jämförelseindexets avkastning (Al-Baidhani m.fl., 2017a). Som jämförelseindex används OMXHPI. Den abnormala avkastningen summeras sedan över elva handelsdagar, fem dagar före och efter publikationsdagen enligt Schadewitz m.fl. (2002). Avkastningen används sedan som beroende variabel i en regression där oförväntat resultat är oberoende variabel. Oförväntat resultat beräknas genom en så kallad naiv modell där vinst per aktie för en räkenskapsperiod förväntas vara lika med vinsten föregående år (Ariff m.fl., 2013).

Sedan används CAR-estimaten från den första regressionen som beroende variabel i den andra regressionen där jag även inkluderar följande oberoende variabler: EARN som anger resultat före extraordinära poster i tusentals euro dividerat med företagets marknadsvärde, LOSS som är en dummyvariabel som antar värdet ett om företaget har rapporterat en förlust och annars noll, ROI som är ett lönsamhetsmått och anger avkastning på investerat kapital, LMC som är ett mått på företagets storlek och anger den naturliga logaritmen av företagets marknadsvärde i tusentals euro, INTAS som är en laggad variabel som anger förhållandet mellan företagets immateriella tillgångar och totala tillgångar, MTB som är ett tillväxtmått som anges genom dividera företagets marknadsvärde med dess bokföringsmässiga värde, GEARING som är ett mått på företagets kapitalstruktur och jämför räntebärande skulder med eget kapital, WC som är ett kassaflödesmått och anger företagets driftskapital i förhållande till omsättning och TIME som är ett tidsindex som antar värdet 0 för 2014, 1 för 2015, ... 4 för 2018.

I studien används paneldata av företagsbokslut hämtade från databasen Voitto+ för år 2014–2018. Information om vinst per aktie hämtades från Börsdata (Börsdata, 2020) och aktie- och indexpriser togs från Nasdaqs webbplats 2015–2019 (NasdaqOMXNordic, 2020). Samplet innehöll från början 137 börsnoterade företag men avgränsades genom att ta bort dubbla aktieserier (Schadewitz och Kanto, 2002), företag inom finans- och försäkringsbranschen och aktier som handlades under fyra euro per aktie (Huang och

Zhang, 2012) samt ytterligare fyra avvikande observationer. Slutligen bestod samplet av 45 företag och 221 företagsobservationer.

Resultaten visade att årsbokslut är värderelevanta för företagets intressenter, mätt enligt investerares reaktion på kapitalmarknaden. Det fanns stöd för H1 som således accepterades. Oförväntat resultat hade en signifikant positiv effekt på abnormal avkastning, och av den orsaken går det att utesluta att den estimerade ERC:n beror på slumpen. Det går dock inte att finna stöd för ett kausalt samband på grund av sampelstorleken. H2 och H3 kunde också accepteras, eftersom CAR signifikant påverkas av variabler från resultat- och balansräkningen. Därtill förkastades H4 på grund av att ingen signifikant effekt hittades, och således kunde inte kassaflödesposter förklara variationen av CAR.

Den estimerade ERC:n är liten i förhållande till resultat från tidigare studier. Även vid jämförelse av tidigare finska studier är estimatet något lägre. Det finns flera möjliga förklaringar. För det första är det viktigt att påpeka att kapitalmarknaden förändras kontinuerligt och redovisningsstandarder och bokföringslagen uppdateras med jämna mellanrum. Tillika antas Helsingforsbörsen ha en mellanstark form av marknadseffektivitet, men tidigare studier har bekräftat att så kallad post-announcement-drift existerar. För det andra publicerar finska företag rapporter före årsbokslutet som till viss del innehåller samma information som årsbokslutet. För det tredje är det möjligt att företagens resultat påverkas av resultatmanipulering och extraordinära poster. Dessutom har kopplingen mellan redovisningsinformation och kapitalmarknaden kritiserats. Således finns det skäl att anta att dessa faktorer tillsammans kan påverka studiens resultat, men utan ytterligare analys går det inte att dra konkreta slutsatser.

Även om resultaten antydde att kassaflödesinformation inte är värderelevant, är det viktigt att poängtera att regressionsmodellen som empiriskt testade H2, H3 och H4 var statistiskt signifikant på enprocentsnivån. Det betyder att studiens oberoende variabler tillsammans kan förklara variationen i kumulativ abnormal avkastning även om ett par variabler inte är signifikanta. Avslutningsvis kan man dra slutsatsen att redovisningsinformationens värderelevans troligen har minskat under 2000-talet. Studien är dock begränsad av sampelstorleken, företagsurvalet och valet av variabler. Genom att öka antalet företag, inkludera finans- och försäkringsbranschen och använda andra variabler är det möjligt att andra resultat nås. Studiens resultat kan inte generaliseras till

andra kapitalmarknader, länder eller företag. Resultaten kan emellertid användas för att jämföra resultat från olika sampel eftersom ERC och CAR som mått är lika, oberoende vilket datamaterial som används. Således finns det ett fortsatt behov av att undersöka värderelevansen av redovisningsinformation i olika sampel. Därtill kunde särskilt kassaflödesinformation analyseras för att säkerställa dess värderelevans. Dessutom begränsas studien av den rudimentära skattningen av abnormal avkastning och oförväntat resultat som används i studien. Resultaten är således preliminära och bör bestyrkas med ytterligare evidens. Fortsatt forskning bör göra en mera djupgående analys av de statistiska egenskaperna och fördelningarna av abnormal avkastning och oförväntat resultat.

REFERENCES

Aboody, D., Hughes, J., & Liu, J. (2002). Measuring value relevance in a (possibly) inefficient market. *Journal of Accounting Research, 40*(4), 965-986.

Al-Baidhani, A. M. (2018). Stock price response to earnings announcements: Developed versus emerging economies. *Corporate Ownership and Control, 15*(4), 29-45.

Al-Baidhani, A. M., Abdullah, A., Ariff, M., Cheng, F. F., & Karbhari, Y. (2017a). Earnings response coefficient: Applying individual and portfolio methods. *Corporate Ownership and Control, 14*(3), 188-196.

Al-Baidhani, A. M., Abdullah, A., Ariff, M., Cheng, F. F., & Karbhari, Y. (2017b). Review of earnings response coefficient studies. *Corporate Ownership & Control, 14*(3), 299-308.

Amir, E., & Lev, B. (1996). Value-relevance of nonfinancial information: The wireless communications industry. *Journal of Accounting and Economics, 22*(1), 3-30.

Ariff, M., & Fah, C. F. (2011). Accounting earnings response coefficient: An extension to banking shares in Asia Pacific countries. *Advances in Accounting, Incorporating Advances in International Accounting, 27*(2), 364-354.

Ariff, M., Fah, C. F., & Ni, S. W. (2013). Earnings response coefficients of OECD banks: Tests extended to include bank risk factors. *Advances in Accounting, Incorporating Advances in International Accounting, 29*(1), 97-107.

Augier, M., & March, J. G. (2007). The pursuit of relevance in management education. *California Management Review, 49*(3), 129-146.

Badu, B., & Appiah, K. O. (2018). Value relevance of accounting information: An emerging country perspective. *Journal of Accounting & Organizational Change, 14*(4), 473-491.

Balachandran, S., & Mohanram, P. (2011). Is the decline in the value relevance of accounting driven by increased conservatism? *Review of Accounting Studies, 16*(2), 272-301.

Ball, R., & Brown, P. (1968). An empirical evaluation of accounting income numbers. *Journal of accounting research, 6*(2), 159-178.

Ball, R., & Shivakumar, L. (2008). How much new information is there in earnings? *Journal of Accounting Research, 46*(5), 975-1016.

Barth, M. E., Beaver, W. H., & Landsman, W. R. (2001). The relevance of the value relevance literature for financial accounting standard setting: Another view. *Journal of Accounting and Economics, 31*(1), 77-104.

Beaver, H. W. (1968). The information content of annual earnings announcements. *Journal of Accounting Research, 6*, 67-92.

Beaver, W. H., McNichols, M. F., & Wang, Z. Z. (2018). The information content of earnings announcements: New insights on intertemporal and cross-sectional behavior. *Review of Accounting Studies, 1*(23), 95-135.

Beaver, W. H., McNichols, M. F., & Wang, Z. Z. (2020). Increased market response to earnings announcements in the 21st century: An empirical investigation. *Journal of Accounting and Economics, 69*(1), 101244.

Bengtsson, B. (2009). Redovisning till verkligt värde eller redovisning till anskaffningsutgift? ett val mellan relevans och tillförlitlighet. *The journal of the Economic Society of Finland, 62*(3), 113-117.

Booth, G. G., Kallunki, J., & Martikainen, T. (1997). Delayed price response to the announcements of earnings and its components in Finland. *European Accounting Review, 6*(3), 377-392.

Börsdata (2020). *Nyckeltal & aktieanalys.* Retrieved 31.01.2020 from https://borsdata.se/.

Brown, S. J., & Warner, J. B. (1980). Measuring security price performance. *Journal of Financial Economics, 8*(3), 205-258.

Bryman, A., & Bell, E. (2011). *Business research methods* (3rd. ed.). Oxford: Oxford Univ. Press.

Campbell, R. H. (2018). Glossary of stock market terms. Retrieved 27.10.2019 from https://www.nasdaq.com/glossary/e/earnings-response-coefficient.

Cascino, S., Clatworthy, M., García Osma, B., Gassen, J., Imam, S., & Jeanjean, T. (2014). Who uses financial reports and for what purpose? Evidence from capital providers. *Accounting in Europe: The Conceptual Framework for Financial Reporting, 11*(2), 185-209.

Chen, G., Firth, M., & Ning Gao, D. (2011). The information content of earnings components: Evidence from the Chinese stock market. *European Accounting Review, 20*(4), 669-692.

Choi, J., Kang, T., & Yoo, Y. K. (2006). The association between analysts' earnings forecast dispersion and the magnitude of earnings response coefficient: "Noise" or "Uncertainty"? *Journal of Contemporary Accounting & Economics, 2*(2), 190-207.

Collins, D. W., Maydew, E. L., & Weiss, I. S. (1997). Changes in the value-relevance of earnings and book values over the past forty years. *Journal of Accounting and Economics, 24*(1), 39-67.

Deegan, C., & Unerman, J. (2011). *Financial accounting theory* (2nd. European ed.). London: McGraw-Hill.

Djurfeldt, G., & Barmark, M. (2009). *Statistisk verktygslåda II - multivariat analys* (1st. ed.). Lund: Studentlitteratur AB.

Djurfeldt, G., Larsson, R., & Stjärnhagen, O. (2010). *Statistisk verktygslåda - samhällsvetenskaplig orsaksanalys med kvantitativa metoder* (2nd. ed.). Lund: Studentlitteratur AB.

Doane, D. P., & Seward, L. E. (2011). Measuring skewness: A forgotten statistic? *Journal of Statistics Education, 19*(2), 1-18.

Easton, P. D., & Harris, T. S. (1991). Earnings as an explanatory variable for returns. *Journal of Accounting Research, 29*(1), 19-36.

Erb, C., & Pelger, C. (2015). "Twisting words"? A study of the construction and reconstruction of reliability in financial reporting standard-setting. *Accounting, Organisations and Society, 40*, 13-40.

Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *Journal of Finance, 25*(2), 383-417.

Feltham, G. A. (1968). The value of information. *The Accounting Review, 43*(4), 684-696.

Filip, A., & Raffournier, B. (2010). The value relevance of earnings in a transition economy: The case of Romania. *International Journal of Accounting, 45*(1), 77-103.

Firth, M. (1976). The impact of earnings announcements on the share price behaviour of similar type firms. *The economic journal, 86*(342), 296-306.

Francis, J., & Schipper, K. (1999). Have financial statements lost their relevance? *Journal of Accounting Research, 37*(2), 319-352.

Frank, K. (2002). The effect of growth on the value relevance of accounting data. *Journal of Business Research, 55*(1), 69-78.

Gjerde, Ø, Knivsflå, K., & Sættem, F. (2011). The value relevance of financial reporting in Norway 1965–2004. *Scandinavian Journal of Management, 27*(1), 113-128.

Gonedes, N. J. (1975). Information-production and capital market equilibrium. *Journal of Finance, 30*(3), 841-864.

Graaf, J. (2016). *The pursuit of relevance*. Stockholm: Stockholm Business School.

Graaf, J. (2018). Equity market interactions: Exploring analysts' role performances at earnings presentations. *Accounting, Auditing & Accountability Journal, 31*(4), 1230-1256.

Hirshleifer, D. (2001). Investor psychology and asset pricing. *Journal of Finance, 56*(4), 1533-1597.

Holthausen, R. W., & Watts, R. L. (2001). The relevance of the value-relevance literature for financial accounting standard setting. *Journal of Accounting and Economics, 31*(1), 3-75.

Huang, Y., & Zhang, G. (2012). An examination of the incremental usefulness of balance-sheet information beyond earnings in explaining stock returns. *Journal of Accounting, Auditing & Finance, 27*(2), 267-293.

Huhn, P. (2019) Industry revenue of »accounting, bookkeeping and auditing activities« in Finland from 2011 to 2023. Retrieved 18.02.2020 from https://www.statista.com/forecasts/391283/accounting-bookkeeping-and-auditing-activities-revenue-in-finland#statisticContainer.

Ihantola, E., & Kihn, L. (2011). Threats to validity and reliability in mixed methods accounting research. *Qualitative Research in Accounting & Management, 8*(1), 39-58.

Jarva, H., & Lantto, A. (2012). Information content of IFRS versus domestic accounting standards: Evidence from Finland. *SSRN Electronic Journal,* (2), 141-177.

Johnson, L. T. (2005). *Relevance and reliability*. The FASB Report: The Financial Accounting Standards Board.

Johnson, R. A., & Wichern, D. W. (1997). *Business statistics: Decision making with data* (1st. ed.). New York: Wiley.

Junttila, J., Kallunki, J., Kärja, A., & Martikainen, M. (2005). Stock market response to analysts' perceptions and earnings in a technology-intensive environment. *International Review of Financial Analysis, 14*(1), 77-92.

Kadous, K., Koonce, L., & Thayer, J. M. (2012). Do financial statement users judge relevance based on properties of reliability? *The Accounting Review, 87*(4), 1335-1356.

Kahneman, D., & Tversky, A. (1979). Prospect theory. *Econometrica, 47*(2), 263-291.

Kanto, A. J., & Schadewitz, H. J. (2000). Market use of disclosure components in interim reports. *Omega, 28*(4), 417-431.

Kim, J. H., & Ji, P. I. (2015). Significance testing in empirical finance: A critical review and assessment. *Journal of Empirical Finance, 34*, 1-14.

Kothari, S. P. (2001). Capital markets research in accounting. *Journal of Accounting and Economics, 31*(1), 105-231.

Kwon, G. (2018). Comparative value relevance of accounting information among Asian countries. *Managerial Finance, 44*(2), 110-126.

Li, F. (2011). Earnings quality based on corporate investment decisions. *Journal of Accounting Research, 49*(3), 721-752.

Lintner, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *The Review of Economics and Statistics, 47*(1), 13-37.

Liu, J., & Thomas, J. (2000). Stock returns and accounting earnings. *Journal of Accounting Research, 38*(1), 71-101.

Lev, B. (1989). On the usefulness of earnings and earnings research: Lessons and directions from two decades of empirical research. *Journal of Accounting Research, 27*, 153-192.

Lukka, K., & Suomala, P. (2014). Relevant interventionist research: Balancing three intellectual virtues. *Accounting and Business Research, 44*(2), 204-220.

Mahjoubi, M. N., & Abaoub, E. (2015). Earnings response coefficient as a measure of market expectations. *International Journal of Economics and Financial Issues, 5*(2), 377-389.

Malkiel, B. G. (2003). The efficient market hypothesis and its critics. *The Journal of Economic Perspectives, 17*(1), 59-82.

Martikainen, M. (1997). Accounting losses and earnings response coefficients: The impact of leverage and growth opportunities. *Journal of Business Finance & Accounting, 24*(2), 277-292.

Martikainen, T., & Ankelo, T. (1990). *On the temporal variation of earnings response coefficients in the Finnish stock market*. Vaasa: University of Vaasa.

Martikainen, T., Kallunki, J., & Perttunen, J. (1997). Finnish earnings response coefficients: The information content of losses. *European Accounting Review, 6*(1), 69-81.

McGoun, E. G. (1997). Hyperreal finance. *Critical Perspectives on Accounting, 8*(1-2), 97-122.

Millo, G. (2017). Robust standard error estimators for panel models: A unifying approach. *Journal of Statistical Software, 82*(3), 1-27.

Mossin, J. (1966). Equilibrium in a capital asset market. *Econometrica, 34*(4), 768-783.

Mostafa, W., & Dixon, R. (2013). The impact of earnings extremity on information content of cash flow. *Review of Accounting and Finance, 12*(1), 81-104.

Mouritsen, J., & Kreiner, K. (2016). Accounting, decisions and promises. *Accounting, Organisations and Society, 49*, 21-31.

NasdaqOMXNordic (2020). Companies listed on Nasdaq Helsinki. Retrieved 27.01.2020 from http://www.nasdaqomxnordic.com/shares/listed-companies/helsinki.

Newey, W. K., & West, K. D. (1987). A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix. *Econometrica, 55*(3), 703-708.

Newey, W. K., & West, K. D. (1994). Automatic lag selection in covariance matrix estimation. *The Review of Economic Studies, 61*(4), 631-653.

Nichols, D. C., & Wahlen, J. M. (2004). How do earnings numbers relate to stock returns? A review of classic accounting research with updated evidence. *Accounting Horizons, 18*(4), 263-286.

Niskanen, J., Kinnunen, J., & Kasanen, E. (2000). The value relevance of IAS reconciliation components: Empirical evidence from Finland. *Journal of Accounting and Public Policy, 19*(2), 119-137.

Nyberg, P., & Vaihekoski, M. (2014). Equity premium in Finland and long-term performance of the Finnish equity and money markets. *Cliometrica, 8*(2), 241-269.

Patatoukas, P. (2014). Detecting news in aggregate accounting earnings: Implications for stock market valuation. *Review of Accounting Studies, 19*(1), 134-160.

Power, M. (2010). Fair value accounting, financial economics and the transformation of reliability. *Accounting and Business Research, 40*(3), 197-210.

Ragab, A. A., & Omran, M. M. (2006). Accounting information, value relevance, and investors' behavior in the Egyptian equity market. *Review of Accounting and Finance, 5*(3), 279-297.

Rautiainen, A., Sippola, K., & Mättö, T. (2017). Perspectives on relevance: The relevance test in the constructive research approach. *Management Accounting Research, 34*, 19-29.

Rossi, M. (2015). The efficient market hypothesis and calendar anomalies. *International Journal of Managerial and Financial Accounting, 7*(3/4), 285-296.

Ryan, B., Scapens, R. W., & Theobald, M. (2002). *Research method and methodology in finance and accounting* (2nd. ed.). London: Thomson.

Sahut, J., Boulerne, S., & Teulon, F. (2011). Do IFRS provide better information about intangibles in Europe? *Review of Accounting and Finance, 10*(3), 267-290.

Schadewitz, H. J., & Kanto, A. J. (2002). The impact of disclosure on the market response to reported earnings. *Scandinavian Journal of Management, 18*(4), 521-542.

Schadewitz, H. J., Kanto, A. J., Kahra, H. A., & Blevins, D. R. (2005). Post-announcement drift in an emerging market. *International Journal of Accounting, Auditing and Performance Evaluation, 2*(1-2), 168-185.

Schadewitz, H. J., Kanto, A. J., Kahra, H., & Blevins, D. R. (2002). An analysis of the impact of varying levels of interim disclosure on Finnish share prices within five days of the announcement. *American Business Review, 20*(2), 33-46.

Scott, W. R. (2015). *Financial accounting theory* (7th. ed.). Toronto: Pearson.

Shapiro, S. S., & Wilk, M. B. (1965). An analysis of variance test for normality (complete samples). *Biometrika, 52*(3/4), 591-611.

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance, 19*(3), 425-442.

Sloan, R. G. (1996). Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review, 71*(3), 289-315.

Socea, A. (2012). Managerial decision-making and financial accounting information. *Procedia - Social and Behavioral Sciences, 58*, 47-55.

Statman, M. (1999). Behaviorial finance: Past battles and future engagements. *Financial Analysts Journal, 55*(6), 18-27.

Stewart, G. B. (2002). Accounting is broken, here's how to fix it: A radical manifesto. *EVAluation (by Stern Stewart & Co.), 5*(1), 1-29.

Taleb, N. N. (2009). Errors, robustness, and the fourth quadrant. *International Journal of Forecasting, 25*(4), 744-759.

Teets, W. R., & Wasley, C. E. (1996). Estimating earnings response coefficients: Pooled versus firm-specific models. *Journal of Accounting and Economics, 21*(3), 279-295.

Treynor, J. L. (1961). Market value, time, and risk. *SSRN Electronic Journal.* Retrieved 15.05.2020 from http://dx.doi.org/10.2139/ssrn.2600356.

Treynor, J. L. (1962). Toward a Theory of Market Value of Risky Assets. Unpublished manuscript. Final version in Asset Pricing and Portfolio Performance (1999), 15-22, Robert A. Korajczyk (ed.). London: Risk Books.

Virtanen, A. (2009). Revealing financial accounting in Finland under five historical themes. *Accounting History, 14*(4), 357-379.

Vollmer, H. (2007). How to do more with numbers: Elementary stakes, framing, keying, and the three-dimensional character of numerical signs. *Accounting, Organisations and Society, 32*(6), 577-600.

APPENDIX: FIGURES AND TABLES

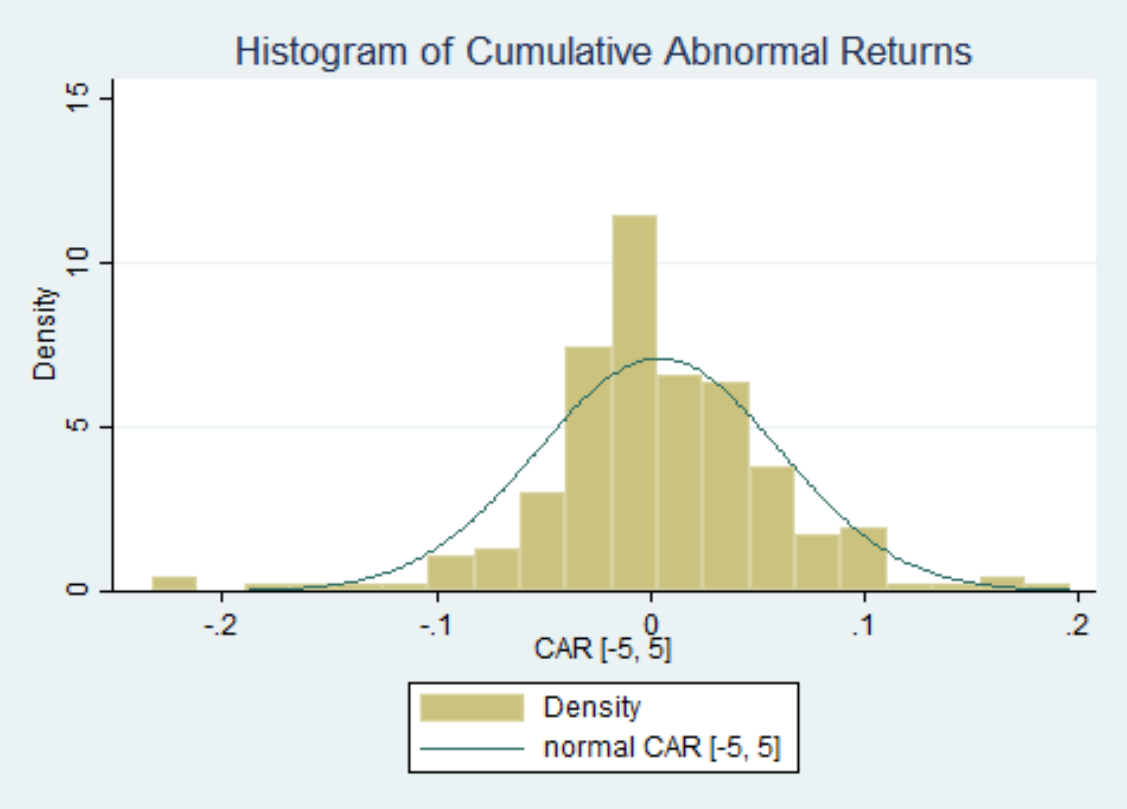

Figure A1a. Histogram of cumulative abnormal returns.

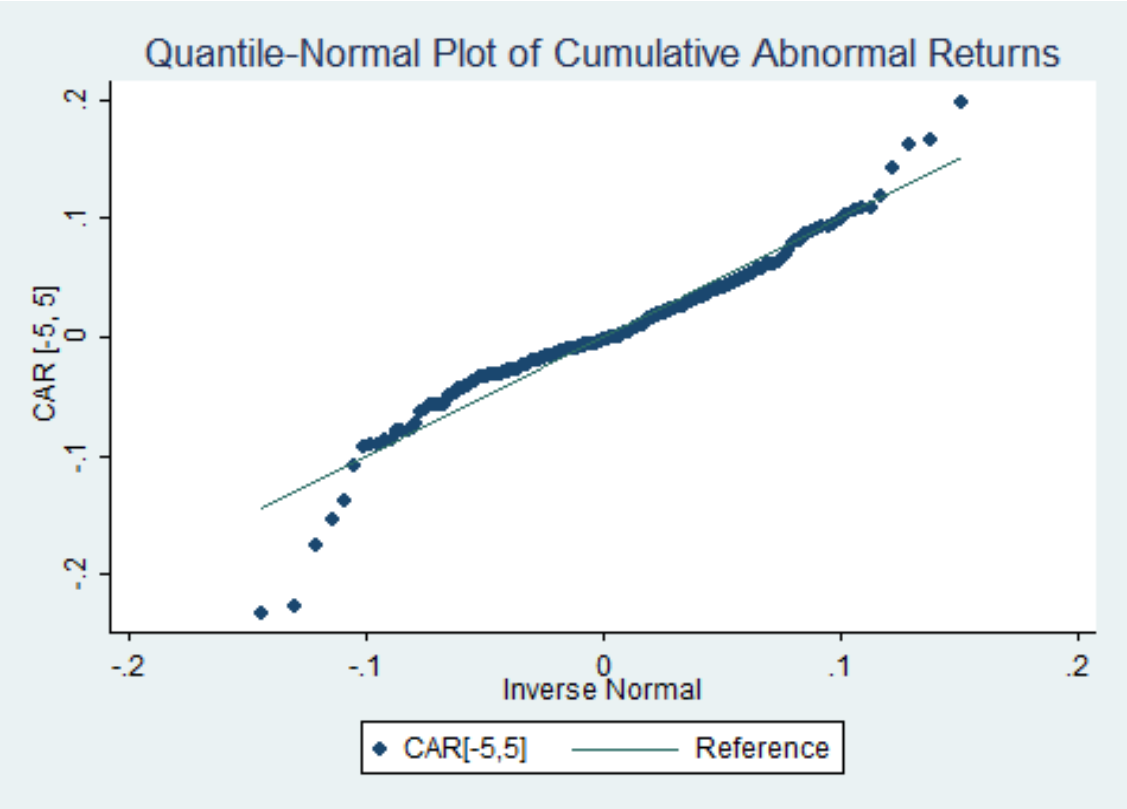

Figure A1b. Quantile-normal plot of cumulative abnormal returns.

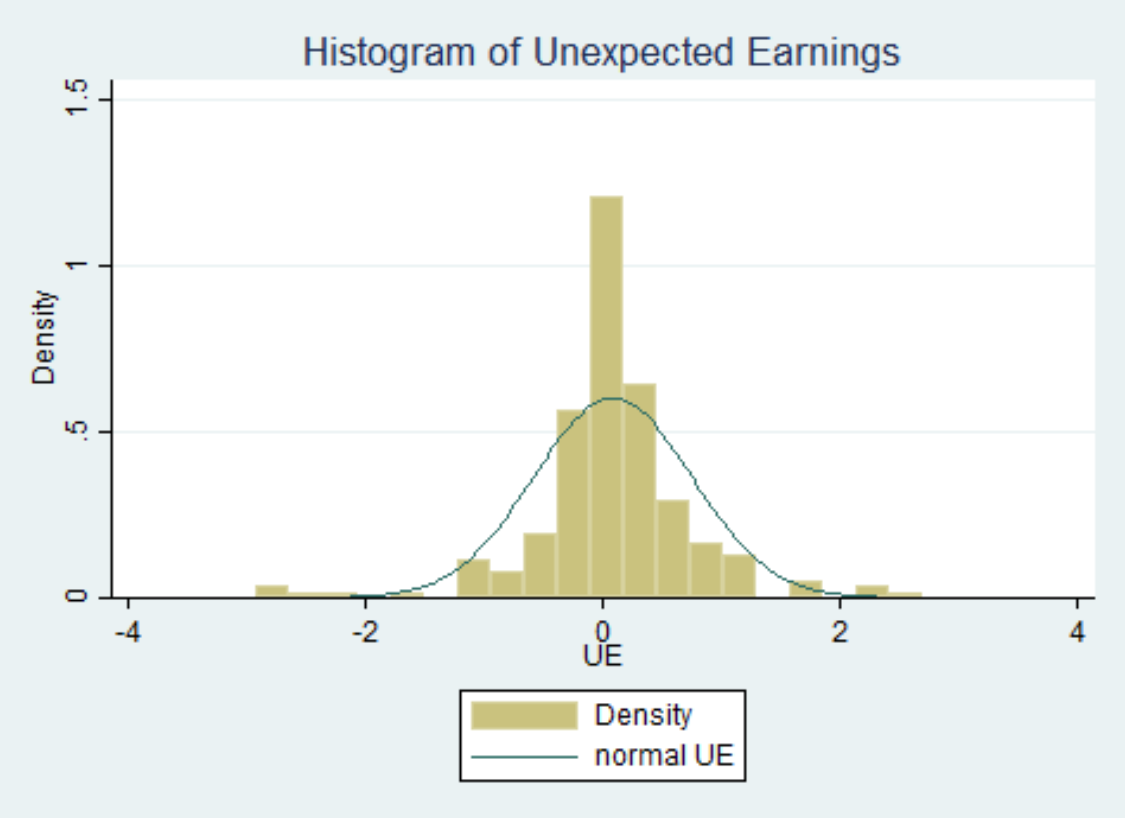

Figure A2a. Histogram of unexpected earnings.

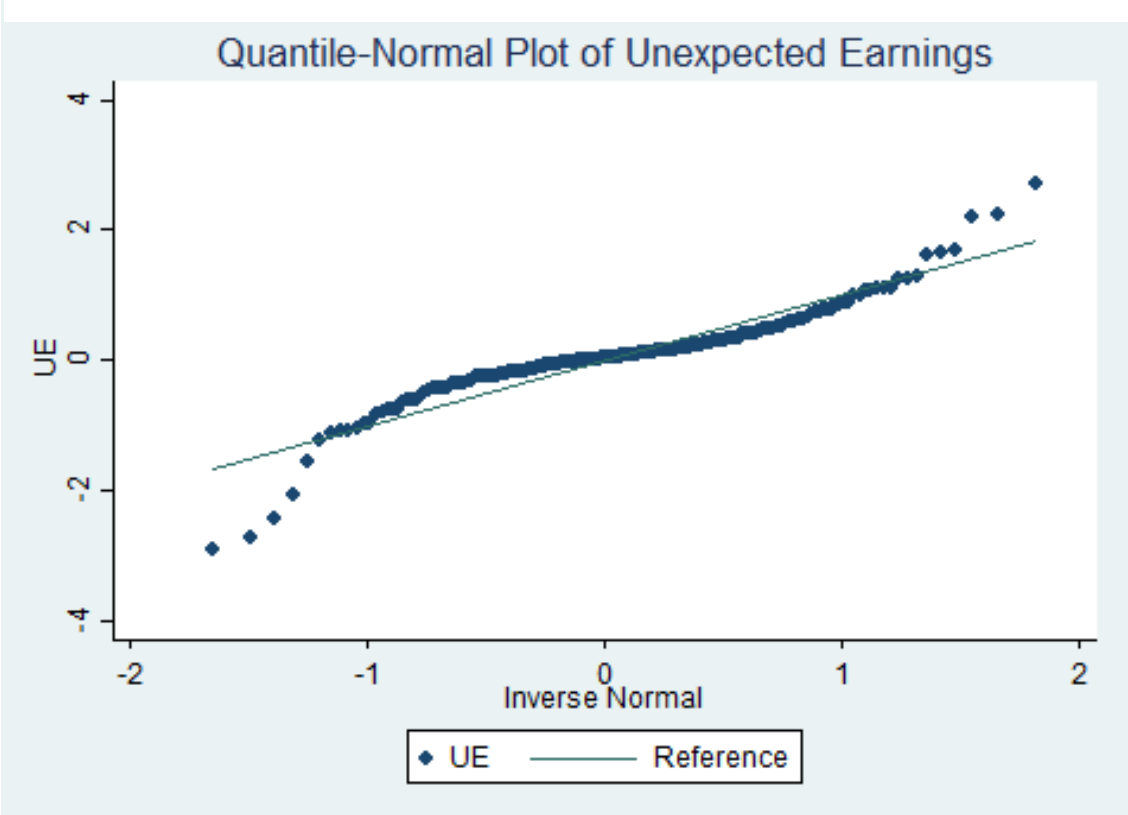

Figure A2b. Quantile-normal plot of unexpected earnings.

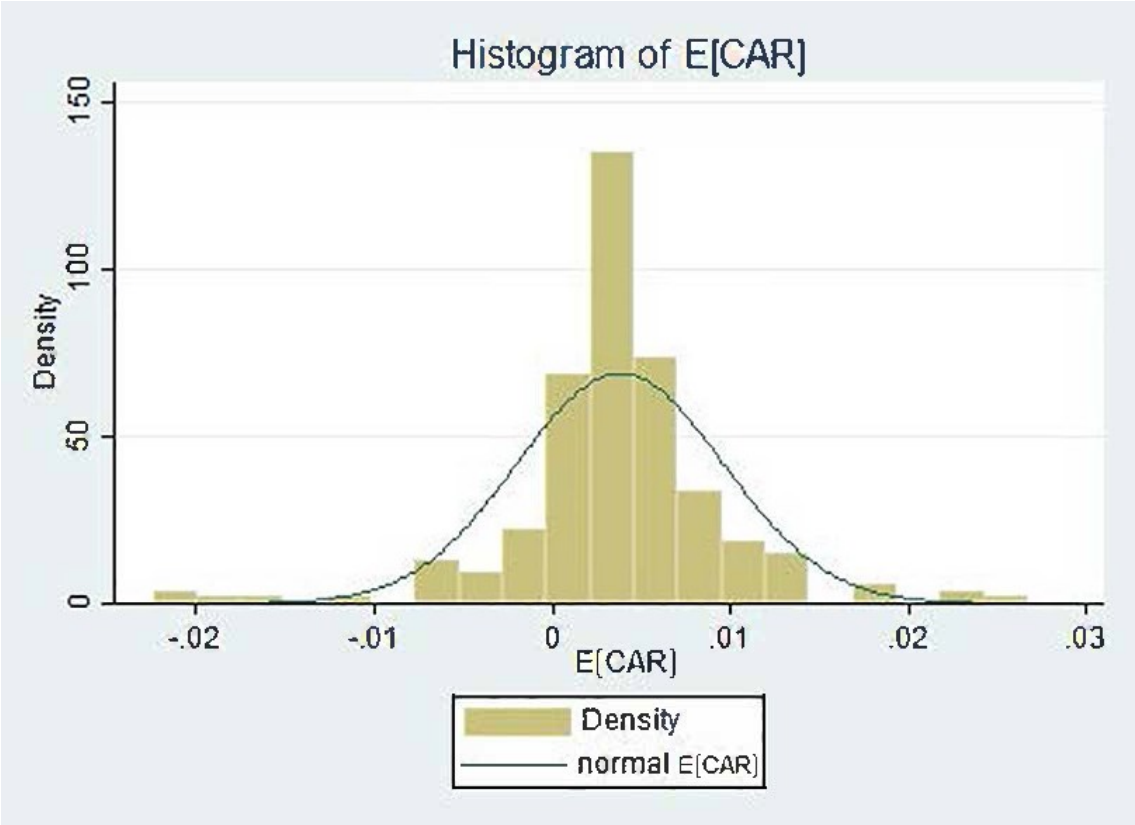

Figure A3a. Histogram of predicted cumulative abnormal returns.

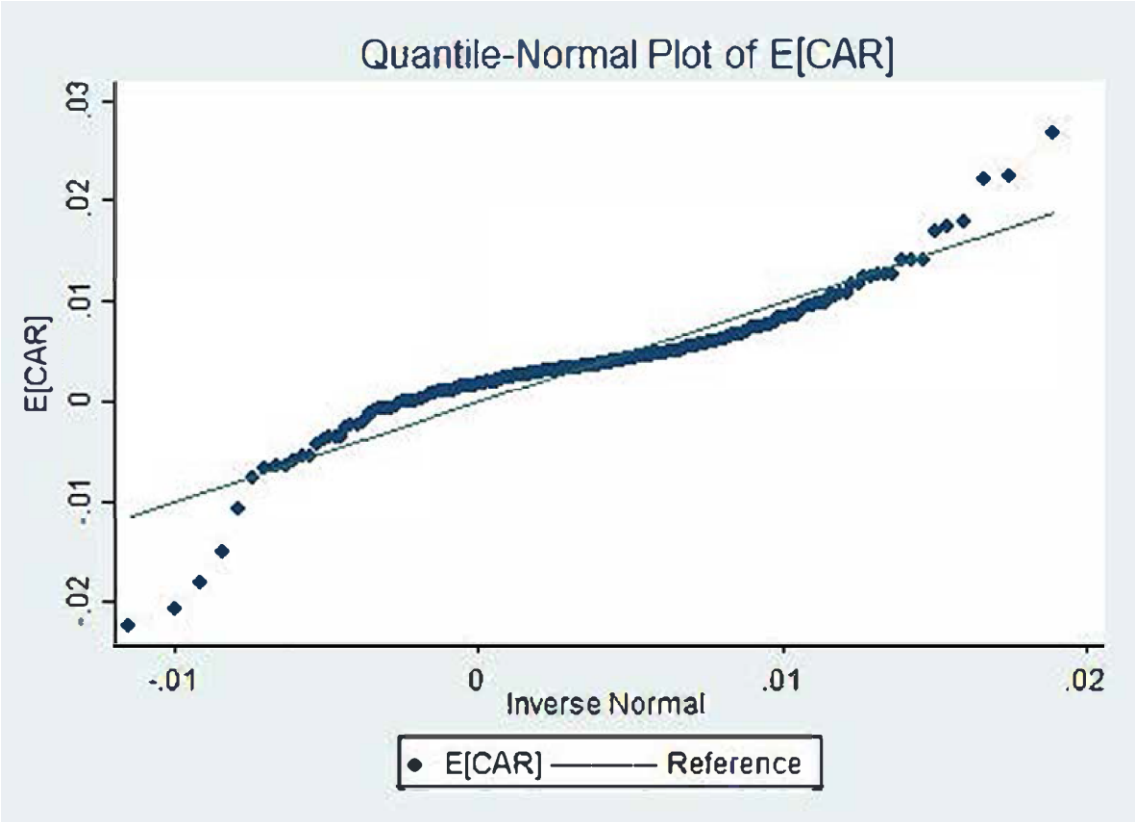

Figure A3b. Quantile-normal plot of predicted cumulative abnormal returns.

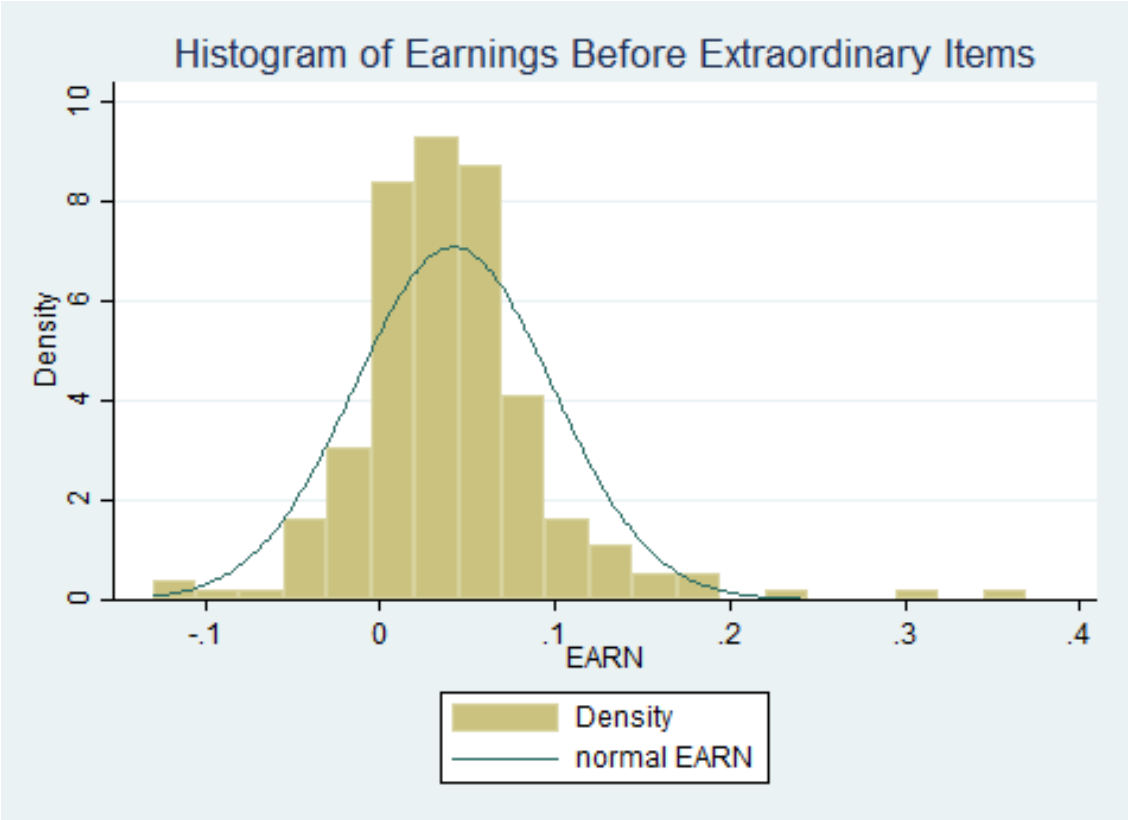

Figure A4a. Histogram of earnings before extraordinary items.

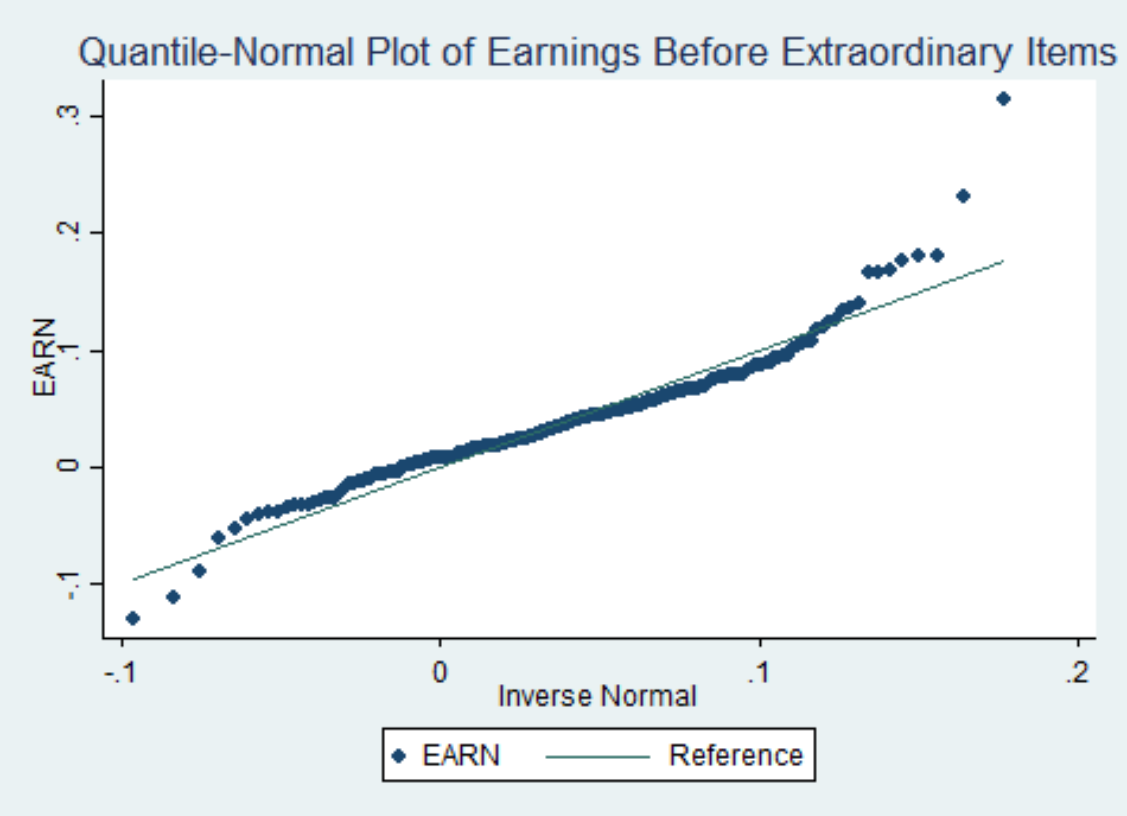

Figure A4b. Quantile-normal plot of earnings before extraordinary items.

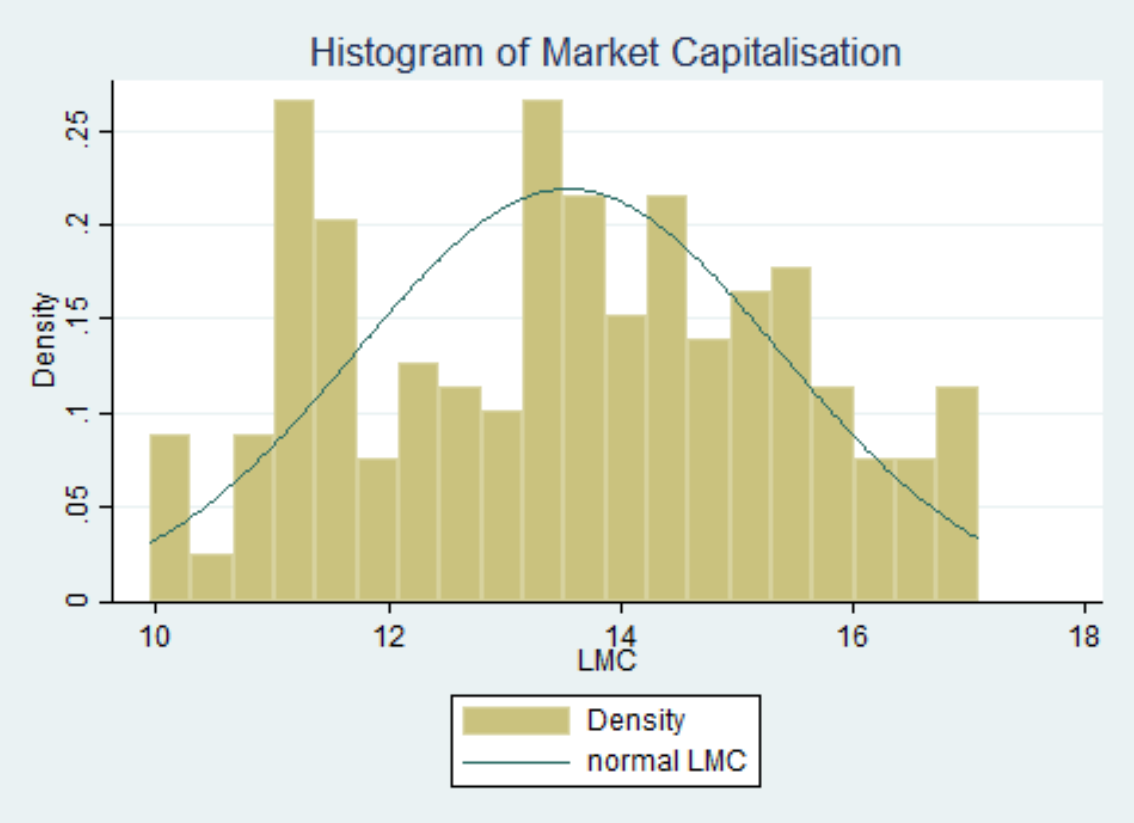

Figure A5a. Histogram of market capitalisation.

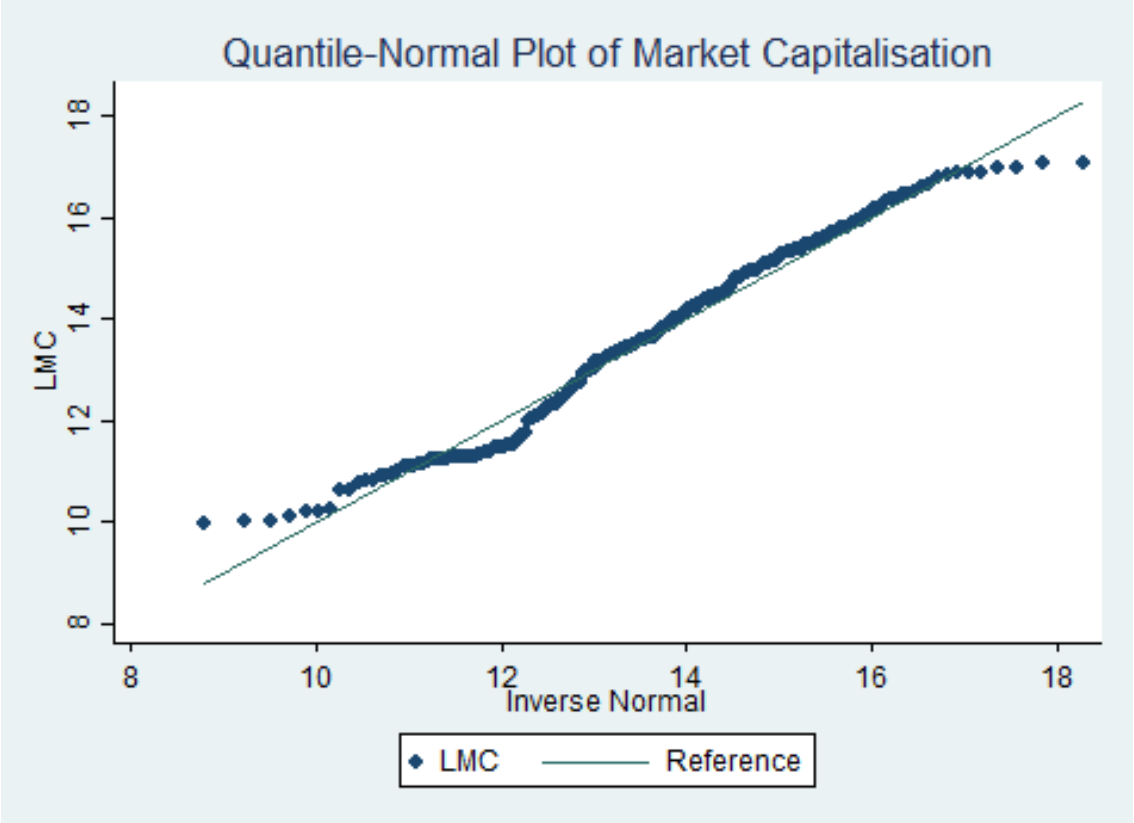

Figure A5b. Quantile-normal plot of market capitalisation.

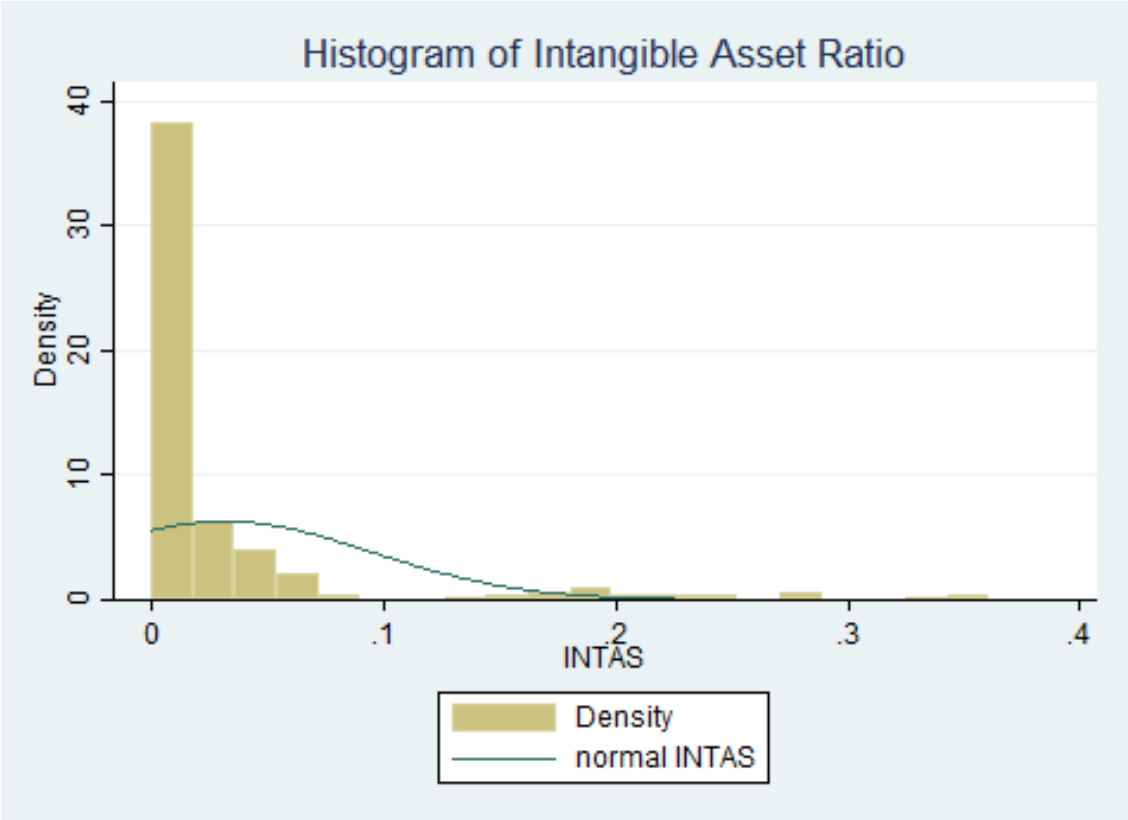

Figure A6a. Histogram of intangible asset ratio.

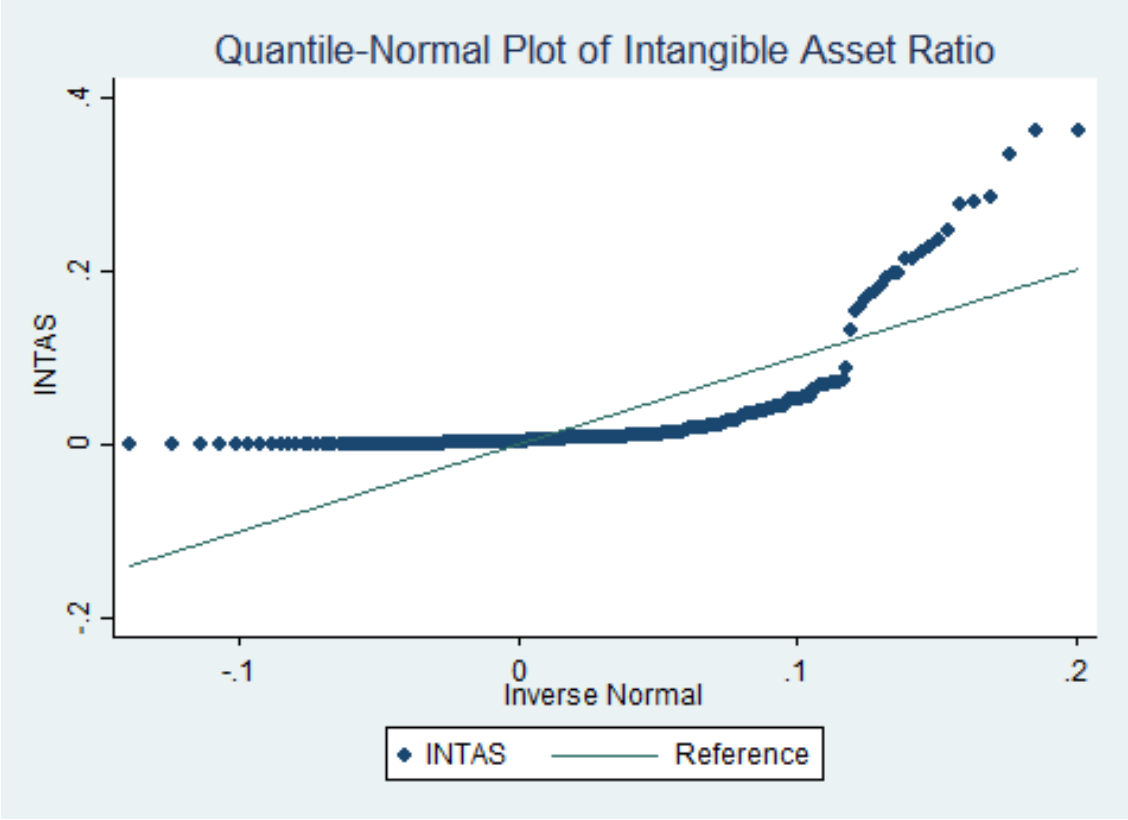

Figure A6b. Quantile-normal plot of intangible asset ratio.

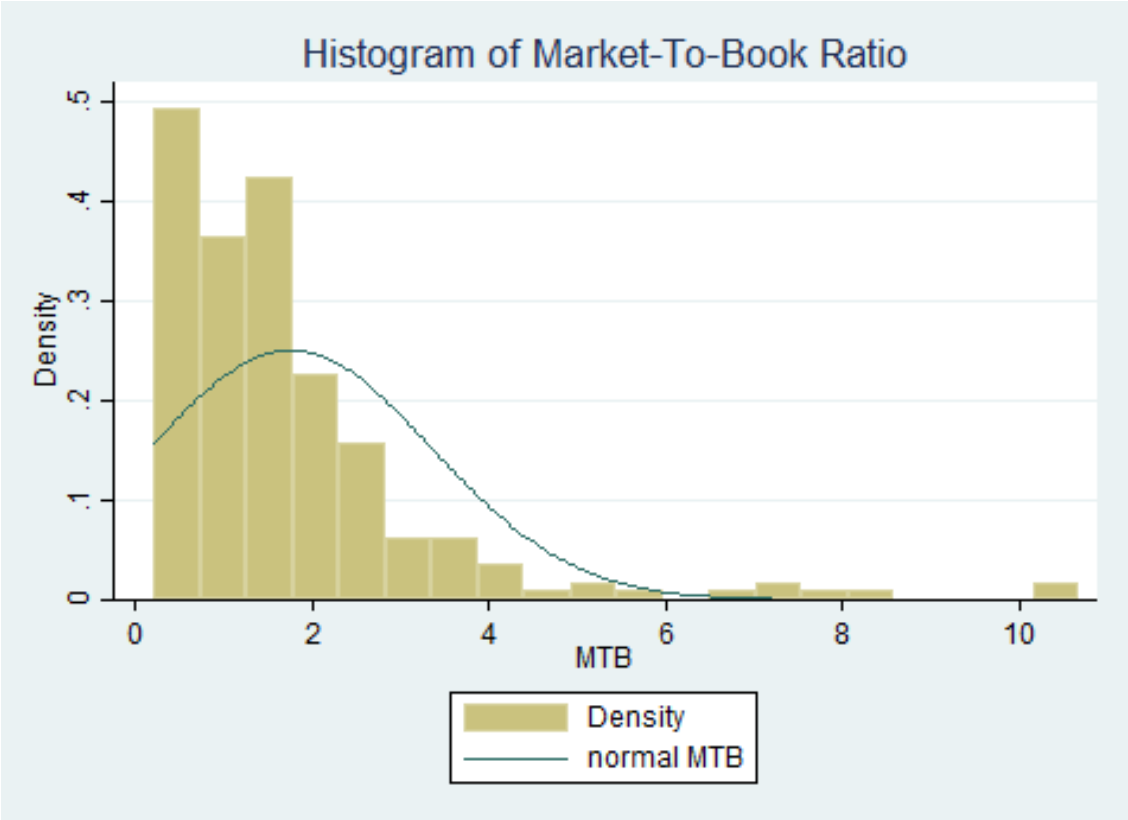

Figure A7a. Histogram of market-to-book ratio.

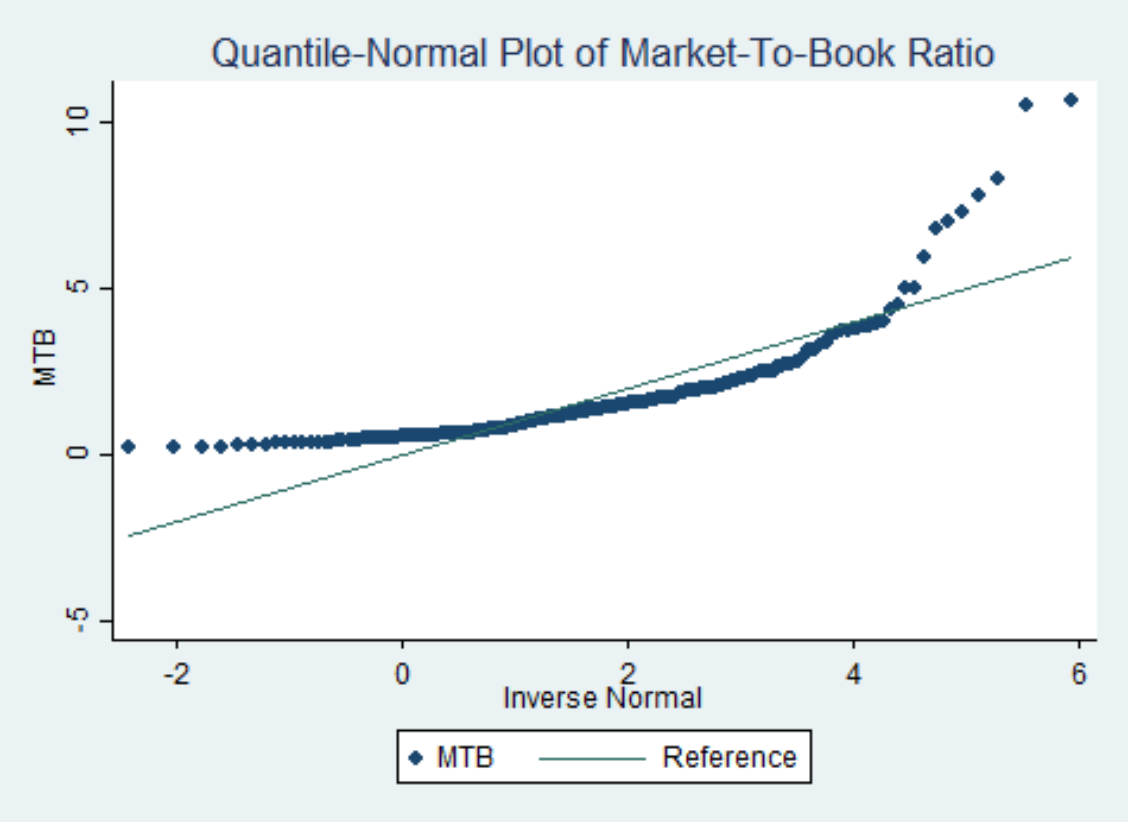

Figure A7b. Quantile-normal plot of market-to-book ratio.

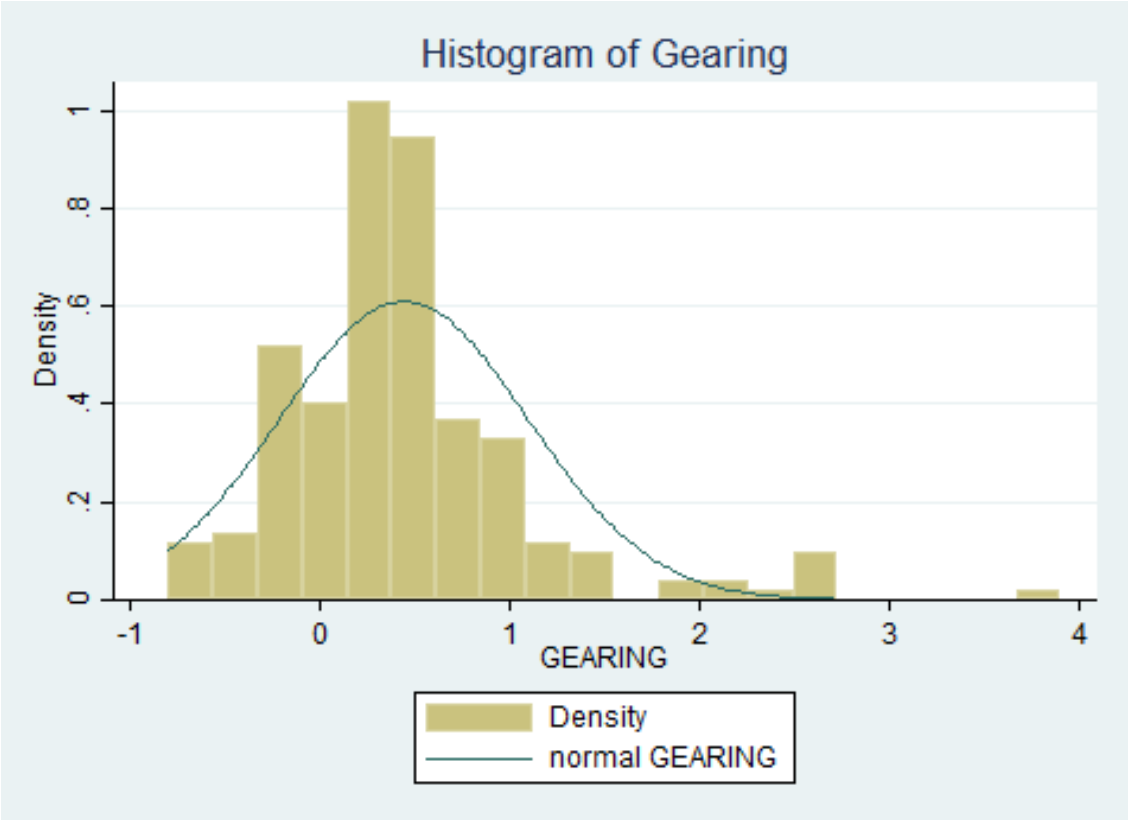

Figure A8a. Histogram of net gearing ratio.

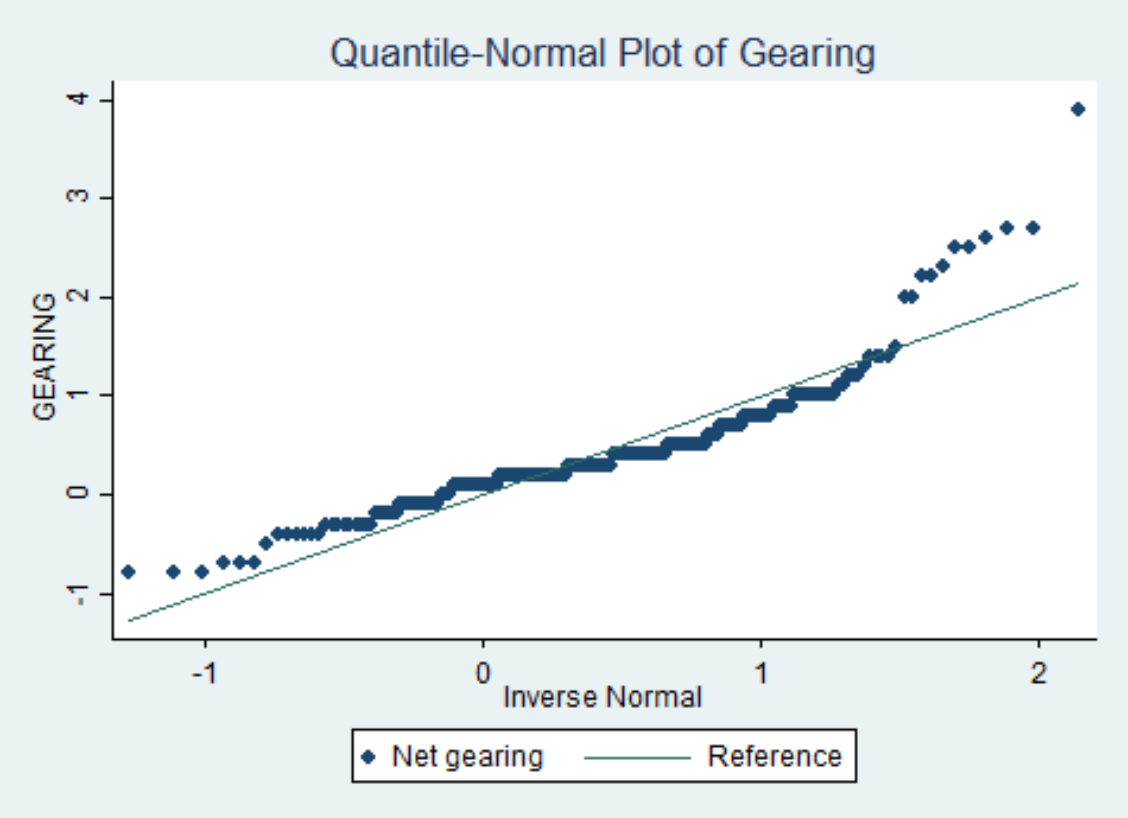

Figure A8b. Quantile-normal plot of net gearing ratio.

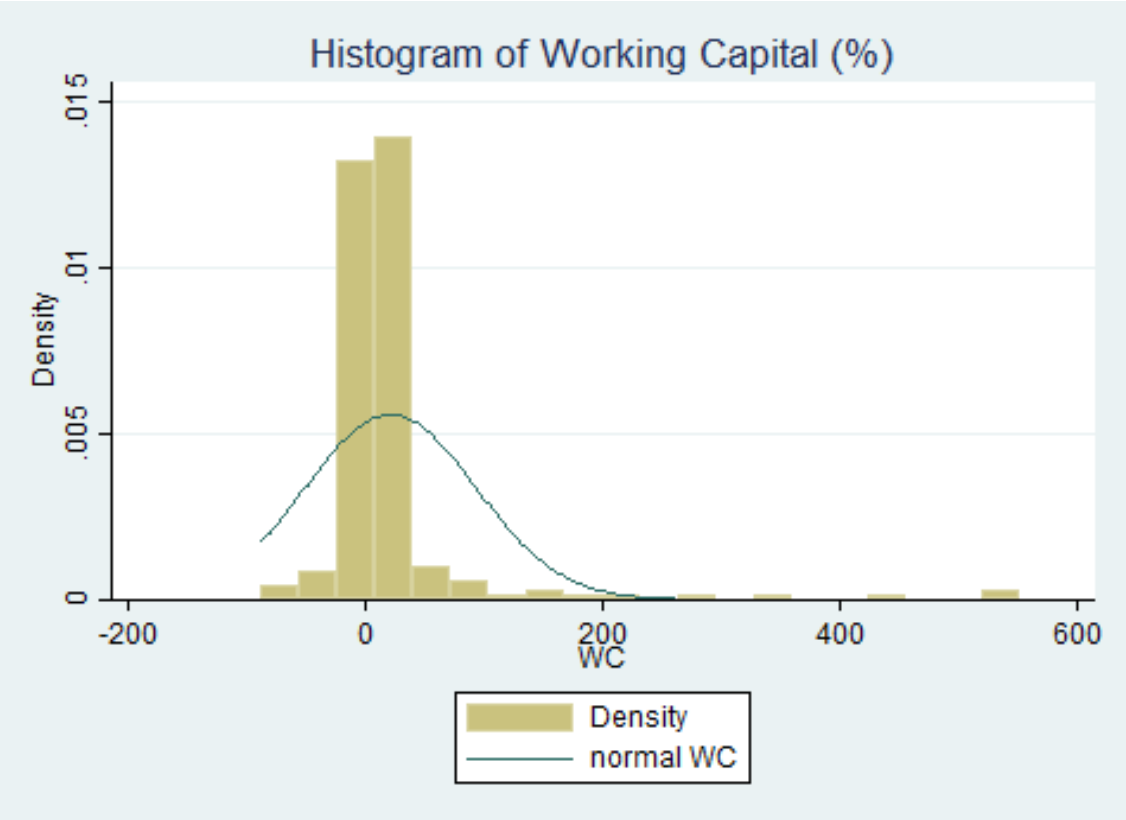

Figure A9a. Histogram of working capital (%).

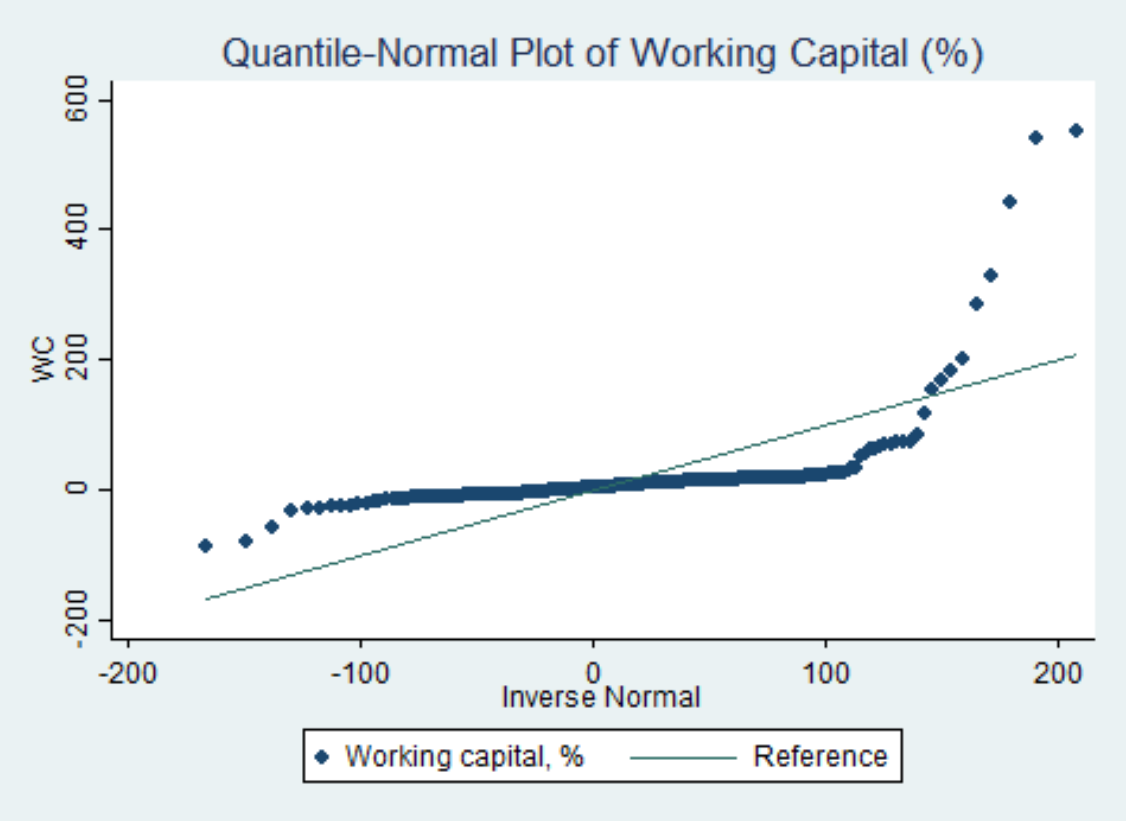

Figure A9b. Quantile-normal plot of working capital (%).

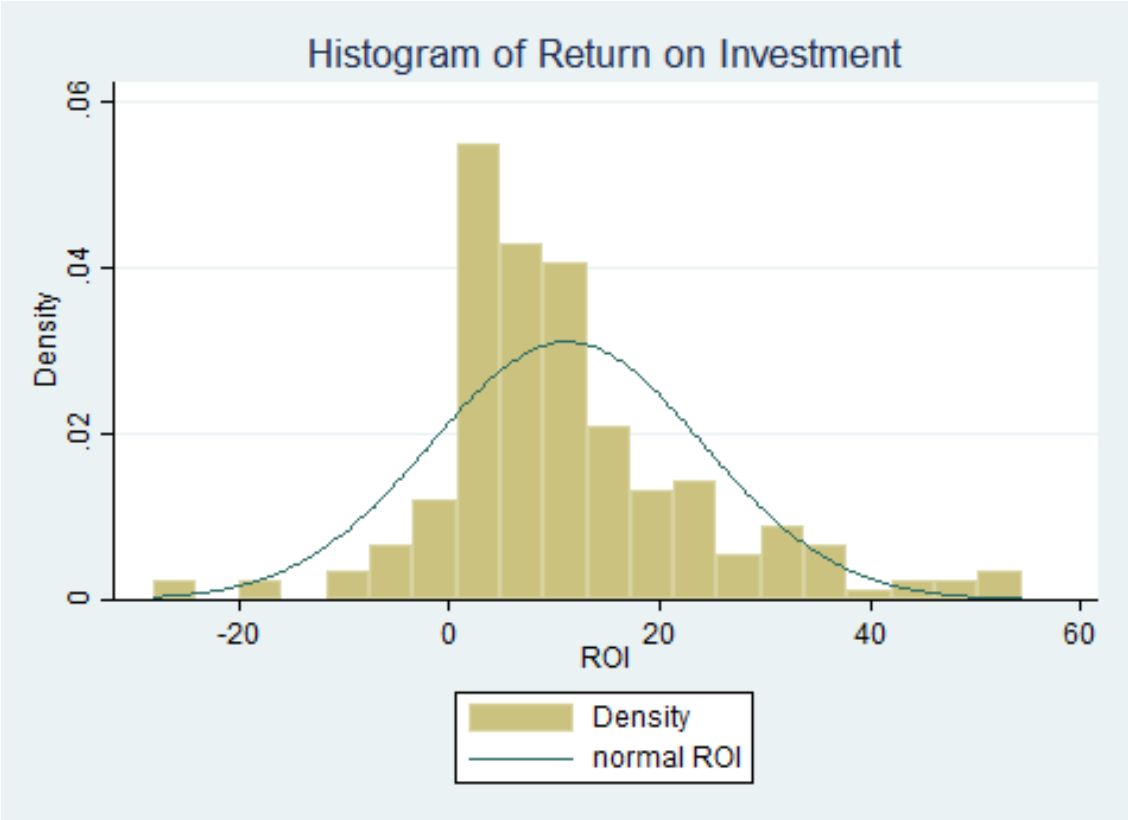

Figure A10a. Histogram of return on investment.

Table A1. *List of Firms in Alphabetical Order*

Firm	Ticker	ID	Industry (ICB)	Cap
Ahlstrom-Munksjö Oyj	AM1	FI4000048418	Basic Materials	Large
Apetit Oyj	APETIT	FI0009003503	Consumer Goods	Small
Aspo Oyj	ASPO	FI0009008072	Industrials	Mid
Atria Oyj A	ATRAV	FI0009006548	Consumer Goods	Mid
Basware Oyj	BAS1V	FI0009008403	Technology	Mid
Biohit Oyj B	BIOBV	FI0009005482	Health Care	Small
Cargotec Oyj	CGCBV	FI0009013429	Industrials	Large
Caverion Oyj	CAV1V	FI4000062781	Industrials	Mid
Cramo Oyj	CRA1V	FI4000384243	Industrials	Mid
Elecster Oyj A	ELEAV	FI0009900658	Industrials	Small
Elisa Oyj	ELISA	FI0009007884	Telecommunications	Large
Exel Composites Oyj	EXL1V	FI0009007306	Industrials	Small
Fiskars Oyj Abp	FSKRS	FI0009000400	Consumer Goods	Large
Fortum Oyj	FORTUM	FI0009007132	Utilities	Large
Huhtamäki Oyj	HUH1V	FI0009000459	Industrials	Large
Kemira Oyj	KEMIRA	FI0009004824	Basic Materials	Large

Keskisuomalainen Oyj A	KSLAV	FI0009007546	Consumer Services	Small
Kesko Oyj B	KESKOB	FI0009000202	Consumer Services	Large
KONE Oyj	KNEBV	FI0009013403	Industrials	Large
Konecranes Oyj	KCR	FI0009005870	Industrials	Large
Lassila & Tikanoja Oyj	LAT1V	FI0009010854	Industrials	Mid
Marimekko Oyj	MMO1V	FI0009007660	Consumer Goods	Mid
Metso Oyj	METSO	FI0009007835	Industrials	Large
Neste Oyj	NESTE	FI0009013296	Oil & Gas	Large
Nokia Oyj	NOKIA	FI0009000681	Technology	Large
Nokian Renkaat Oyj	TYRES	FI0009005318	Consumer Goods	Large
Olvi Oyj A	OLVAS	FI0009900401	Consumer Goods	Mid
Orion Oyj B	ORNBV	FI0009014377	Health Care	Large
Ponsse Oyj 1	PON1V	FI0009005078	Industrials	Mid
PunaMusta Media Oyj	PUMU	FI0009900468	Consumer Services	Small
Raute Oyj A	RAUTE	FI0009004741	Industrials	Small
Revenio Group Oyj	REG1V	FI0009010912	Health Care	Mid
Saga Furs Oyj C	SAGCV	FI0009800551	Consumer Goods	Small
Siili Solutions Oyj	SIILI	FI4000043435	Technology	Small
Stora Enso Oyj R	STERV	FI0009005961	Basic Materials	Large
Teleste Oyj	TLT1V	FI0009007728	Technology	Small
TietoEVRY Oyj	TIETO	FI0009000277	Technology	Large
Tikkurila Oyj	TIK1V	FI4000008719	Industrials	Mid
UPM-Kymmene Oyj	UPM	FI0009005987	Basic Materials	Large
Uponor Oyj	UPONOR	FI0009002158	Industrials	Mid
Vaisala Oyj A	VAIAS	FI0009900682	Industrials	Mid
Valmet Oyj	VALMT	FI4000074984	Industrials	Large
Viking Line Abp	VIK1V	FI0009005250	Consumer Services	Mid
Wärtsilä Oyj Abp	WRT1V	FI0009003727	Industrials	Large
YIT Oyj	YIT	FI0009800643	Industrials	Large

Table A2. *Frequency Distribution of Dummy Variable LOSS*

Loss	Frequency	Per cent	Cumulative Per cent
0	202	91.40	91.40
1	19	8.60	100.00
Total	221	100.00	

Note. The variable LOSS assigns the value one if a firm reported a loss in its income statement during time *t* and zero if profit.